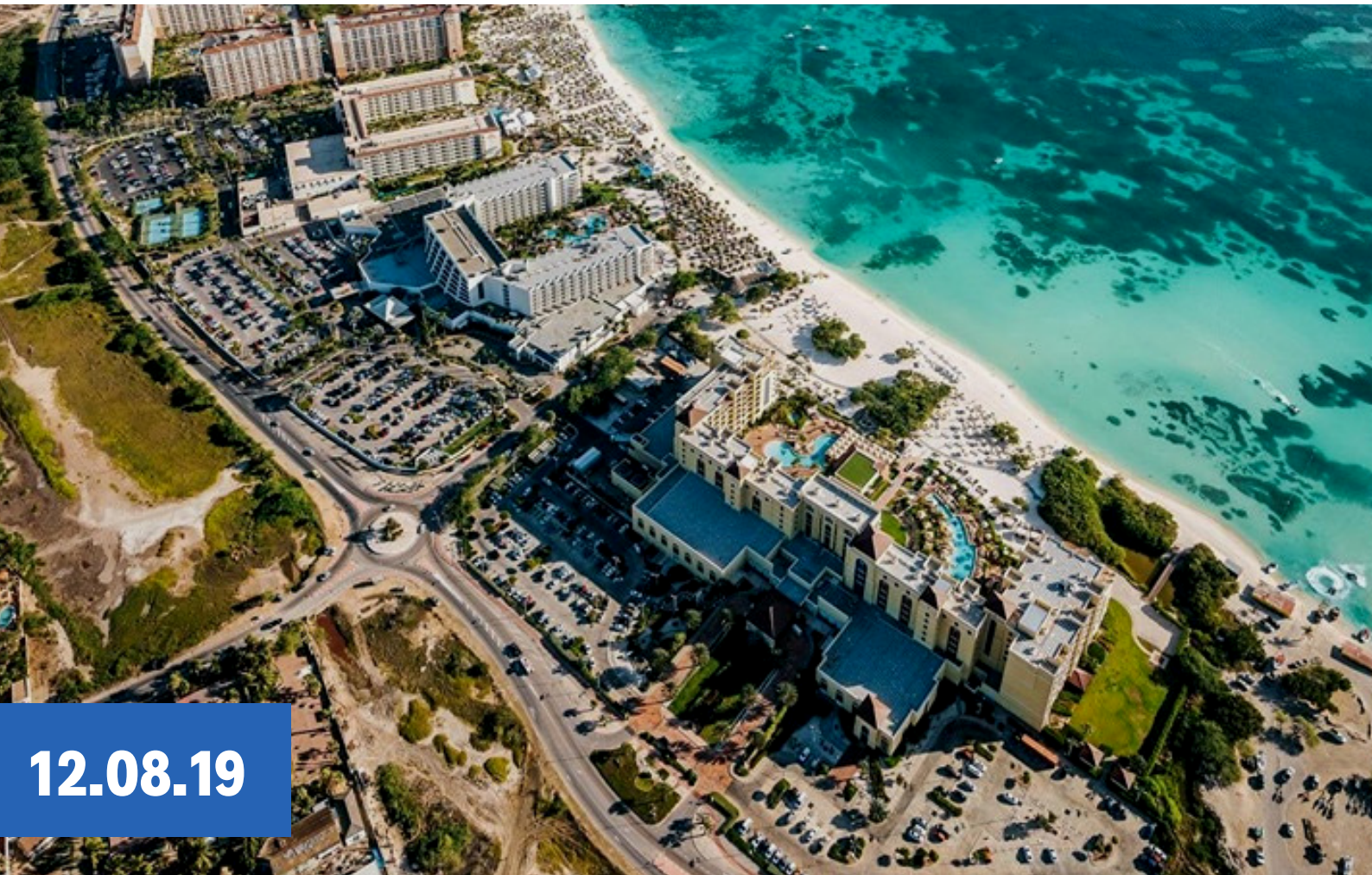


MASTER THESIS

THE ROAD TOWARDS AN INNOVATIVE ARUBA

A Q-Analysis on the Synergy Between the Creative Industry and Knowledge Economy as a Driver to Stimulate Socio-Economic Development in Aruba's Local Innovation System.



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Abstract

In recent years, economists have come to recognize the role of technology, as well as information, innovation, and creativity, in expanding economic potential towards sustainable development. An innovative economy that is driven by knowledge, creativity, technology, and anchored in strong values will help build resilience in small island developing states (SIDS). The aim of this research is to contribute with knowledge towards the innovative development on small island states, specifically Aruba, considering its socio-economic circumstances and necessity to catch up to other developed countries. The main research question is: “How can a synergy between the creative industry and a knowledge-based economy, implemented within a Quadruple Helix Innovation Model to stimulate sustainable socio-economic development in the local innovation system of Aruba?”. This research is conducted as a case study and makes use of a mixed method approach to measure human subjectivity with the help of a participatory policy instrument, the Q-methodology. A total of 28 participants contributed to the results of this research. The Q-sorting consisted of a Q-sample of 40 statements, which was collected online with the use of the Q-sortware software. The Q-analysis of the collected data resulted in five social perspectives, which are categorized as; Team Players, Growth Seekers, Neutralists, Innovation Enthusiasts, Innovation Sceptics, and Innovators. At the end, the results conclude that a possible synergy between the creative industry and knowledge economy could thrive through a Citizen-centered Living Lab Quadruple Helix Innovation Model in the future, however, effective policy measures will be necessary to see this through.

Keywords: Creative Industries, Knowledge Economy, Synergy, Quadruple Helix Innovation Model, SIDS, Innovation, Social Innovation, Talent Development, Entrepreneurship, Public Policy

Preface

Before you, lies the master thesis “The Road Towards an Innovative Aruba: A Q-Analysis on the Synergy of the Creative Industry and Knowledge Economy as a Driver to Stimulate Socio-Economic Development in Aruba’s Local Innovation System”. This research serves as my final work for the Master of Science in Public Policy and Human Development and as the fulfillment of the graduation requirement of the Maastricht Graduate School of Governance (MGSoG) of Maastricht University and the United Nations University – Maastricht Economic and Social Research Institute on Innovation and Technology (UNU-MERIT).

The desire of investigating the possible policy synergy between the creative industry and knowledge economy in Aruba stems from my previous thesis research for the Organization, Governance & Management (OGM) bachelor program at the University of Aruba (UA). This bachelor thesis titled: “Placing Culture and Creativity at the Heart of the Aruban Sustainable Development: An Exploratory Research of the Possible Economic, Cultural and Social Impact of a Creative Industry”, paved my way to the search for economic diversification of the Aruban economy through a creative industry and identification of the development impact it would have on the Aruban society. After a successful defense leading to my graduation, I became a columnist for Aruba Today in August, 2018. The bi-weekly column titled “Creative Islander”, is dedicated to topics such as innovation, sustainability, creativity, culture and socio-economic development. As part of my master’s program, I decided to follow my passion and specialize in “Innovation, Institutions and Development”, thus encouraging the continuity of my previous research work related to creative industries and innovation. As the current Aruban Government has identified the six prospective economies aimed for diversification in the Economic Policy 2019-2022, I decided to consider a possible policy synergy between the creative industry and knowledge economy. Seeing my research trajectory over the years, my primary objective has always been to contribute with knowledge, data, and recommendations for the innovative and sustainable development of my home country, Aruba.

The intention behind the title “The Road Towards an Innovative Aruba” captures the symbolic meaning of Aruba’s journey towards innovation, starting from the early industries such as the gold and phosphate mining, agriculture, fishery, aloe industry, and oil refining to the most prominent industry Aruba has known thus far: tourism. This identification translates into the different characteristics roads can have and the numerous directions Aruba has taken in the past to secure economic stability and resiliency, but also the directions it will take going into the future securing not only a sustainable society but most important, an innovative Aruba.

Acknowledgements

Each research journey is unique and full of meaningful learning opportunities. The completion of this master thesis was possible thanks to numerous individuals and institutions who believed in this research. First, I would like to thank my mentor Dr. Julietta Marotta who from the beginning guided me in establishing my research topic. Second, I would like to express my sincerest gratitude to my thesis supervisor Dr. Serdar Türkeli for his guidance and support from start to finish of my master thesis journey. Furthermore, to all my MPP colleagues, PhD fellows and lecturers at UNU-MERIT, thank you for making this a meaningful and inspiring journey. Most importantly, I would like to thank all participating institutions representing the Government of Aruba, private sector, academia, NGOs and Aruban community, who expressed their willingness to participate and whom without their contribution this research would not have been possible. These participating institutions include:

Assistant to the Management Board, AIB Bank N.V | PR & Marketing Manager, Aruba Bank N.V | Managing Director, ATECH Conference & CR38TE Foundation | Trademark Administrator, Bureau of Intellectual Property of Aruba | Director, Cas di Cultura | General Manager, Central Bank of Aruba | Director, Central Bureau of Statistics of Aruba | Policy Advisor, Chamber of Commerce of Aruba | Director, Cosecha Aruba | Policy worker, Department of Culture Aruba | Head Research Department, Department of Labor & Research of Aruba | Independent Journalist, D. Arends – Geerman | Innovation Policy Officer, Arubahuis | Innovation Advisor, Futura | Vice-President, Global Shapers Oranjestad | Vice-President, Go Cultura | Co-Founder, Island Impact Aruba | Project Coordinator, Metabolic Foundation Aruba | Policy Advisor, Ministry of Education, Science & Sustainable Development of Aruba | Junior Business Advisor, Qredits Aruba | Training Manager, Setar N.V | Policy Advisor, Social and Economic Council of Aruba | Member, National Aruba SDG Commission | Secretary General, Aruba National Commission for UNESCO | Lecturers, Researchers & Program Managers, University of Aruba.

Also, thank you to James Løkås for taking the time to assist me with the English language corrections of this thesis. Lastly, to my parents, Jeanine G. Franken – Tujeehut and Ronald A. Franken, siblings, remaining friends and family, thank you from the bottom of my heart for your continuous support.

Thais G. Franken | Maastricht, August 12th 2019

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Abbreviations

| | |
|-----------|--|
| CCI | Cultural & Creative Industries |
| ECLAC | Economic Commission for Latin America and the Caribbean |
| GDP | Gross Development Product |
| ICT | Information and Communication Technology |
| IPR | Intellectual Property Rights |
| IR | Industrial Revolution |
| ITT | International Technology Transfer |
| MNE | Multi National Enterprise |
| MSME | Micro, Small and Medium Enterprise |
| NIS | National Innovation System |
| QHIM | Quadruple Helix Innovation Model |
| R&D | Research & Development |
| SDG | Sustainable Development Goals |
| SI | System of Innovation |
| SIDS | Small Island Developing States |
| SISSTEM | Sustainable Island Solutions through Science, Technology, Engineering & Mathematics |
| SME | Small and Medium Enterprise |
| STEM | Science, Technology, Engineering & Mathematics |
| STI | Science, Technology & Innovation |
| SWOT | Strengths Weaknesses Opportunities & Threats |
| THIM | Triple Helix Innovation Model |
| UN | United Nations |
| UNDP | United Nations Development Program |
| UN-OHRLLS | United Nations Office of the High Representative for the Least Developed Countries |

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1. Introduction

For a long time, according to Persaud (2001), economists saw capital, labor, and natural resources as the essential ingredients of the economic industry. In recent years, these economists have also come to recognize the role of technology, as well as information, innovation, and creativity, in expanding economic potential towards sustainable economic development. According to the Central Bank of Aruba (2018), Aruba's economic outlook and well-being of its people are reliant on the island's innovation capacity. Innovation could therefore serve as an accelerator to improve productivity, and support sustainable socio-economic development. As small island states are vastly reliant on outside factors, making it even more pressing to achieve economic stability and strengthen resiliency to adversity, Aruba is now bridging numerous gaps which is highly necessary going forward. Economies that is value innovation driven by knowledge, creativity, technology, will help strengthen resilience in small island developing states (SIDS). The Government of Aruba has presented six prospective economic pillars that could create more resilience, economic diversification, and stimulate economic activity on the island. Two of these economies are the knowledge economy and the creative industry. The vision of encouraging these industries on Aruba cannot be carried out without a development impact of some sort. For this reason, the question as to the potential impact of a creative industry on the Aruban economy is relevant, but, even more so how these economies, policy-wise, can successfully be implemented within the Aruban context.

1.1 Research Problem

Over the past decades innovation has become a front-runner for sustainable development around the world, fostering change, diversity, creativity, and empowerment. Amongst all developed countries, small island states such as Aruba face more challenges in keeping up with these advancements. Aruba's economy is highly dependent on tourism, a dynamic industry that is sensitive to numerous external factors. Diversification of Aruba's economy is not a matter of growth or stability, it is critical to survival in the 21st century (ATECH, 2017). According to the SWOT analysis conducted by the Central Bank of Aruba through the State of Innovation Survey 2017, Aruba faces six big challenges on the road to an innovative future. These challenges include; the Aruban mindset, red-tape, environment, talent gap, youth unemployment, and capital funding.

According to the Central Bank of Aruba (2018) in the *Isla Innovativo Report*, "Aruba's economic future and well-being of its citizens are dependent on the island's innovation capacity.

Innovation can improve productivity, economic growth, and support sustainable development. A small island state is highly dependent on outside factors, which makes it even more pressing to achieve economic stability and strengthen resiliency to adversity. An innovation focused economy that is driven by knowledge, creativity, technology, and anchored in strong values will help build resilience” in a small island developing state, to achieve the desire of catching up with other developed economies. The importance of innovation is more extensive than just a technological issue. Innovation is progress hand in hand with sustainable socio-economic development, which in Aruba’s context is highly necessary going forward. Aruba’s demand for economic and financial transformation will require innovative solutions.

Besides this, Aruba has been experiencing a growing professional diaspora, resulting in a brain drain dilemma and severe educational gap on the island. According to the Isla Innovativo Report, it is estimated that on average 300 students leave annually to study abroad. However, only an estimated 20% return within three to five years with a degree and less than 25% of the young professionals believe there are local growth or business opportunities for them. Bringing Aruban leaders, students, professionals, and experts together can lead to lasting commitment to changing the narrative of Aruba, to re-imagine the economy, and co-create innovative solutions (ATECH, 2017). In order to be successful in bringing Aruban professionals back to the island, the infrastructure needs to be there; jobs need to be created, economic markets should be developed, policies and legislation should be in place, stakeholders should be engaged and empowered, and the government needs to be facilitating digital procedures, incubation, funding, and talent development. Overall, as a growing island, Aruba could use innovation as a tool to limit its vulnerability and challenges, by creating a prosperous community for future generations. This research serves as a structural outlook for innovation development between two prospective economic pillars on Aruba, namely the creative industry and the knowledge economy.

1.2 Research Purpose and Relevance

Aruba has been working on the sustainable development of its economy and community for some years now and many advancements have been made in projects related to green energy, infrastructure and ecological initiatives (Franken, 2018). There is a great need for academic support in the private sector, fueled by data. Thus, the central purpose for conducting this research is to contribute with knowledge towards the innovative development on small island states, Aruba specifically, considering its socio-economic circumstances and necessity to catch up with other sustainably developed countries. Besides a personal motivation, this research is

relevant to other areas such as, academics, policy development, and economic sustainability. First, there is a literature gap in emerging economies related to knowledge economy and creative industry on SIDS such as Aruba. Most literature that discuss these two economies are aimed at developed countries and particularly countries with thriving economies and social spectrums. The history and development of the concept of innovation indicates that assessment models for innovation acceleration can be useful for analyzing innovation progress in less developed economies. As Aruba, with a less developed economy, has been making attempts in diversifying its economy, they would be a prime case for such an analysis.

Second, in October 2018, the Minister of Economy, Finances and Culture of Aruba mr. Xiomara Ruiz – Maduro presented six promising pillars with the commitment to expand the Aruban one pillar economy, namely, Tourism Economy, Knowledge Economy, Agriculture Economy, Maritime and Logistics, Circular Economy, and the Creative Industries. Innovation remains a central component within all these six economic pillars, thus research on how Aruba could maximize innovation on a national level can help all stakeholders strategically work together in transforming Aruba into a sustainable society. With this, considering the practical and theoretical commonalities between the creative industry and the knowledge economy, this research provides the opportunity of ascertaining a possible policy synergy towards a sustainable and prosperous Aruba.

One critical observation presented in previous research on the Aruban creative industry in 2018, included the absence of public policy regarding these emerging economies connected through innovation. The Quadruple Helix Innovation Model is a potential framework for designing innovation policy at the national level not only in EU countries, but sub-national island jurisdictions, such as Aruba. This innovation policy addresses not only policies related to technology or the economy, but also touches policy in areas of social welfare, education, environment, infrastructure, tourism, health care, and public governance. The Quadruple Helix Innovation Model, could therefore serve as a national framework with equal participation of all stakeholders involved in the development of the Aruban creative industry and knowledge economy.

Furthermore, based on the Isla Innovativo report (2018) five innovation spaces were identified moving forward: e-Government, Fintech & Regtech, Social Innovation, Talent, and Entrepreneurship & e-Commerce. Considering the work and research that is currently being done on e-government, this research will focus on three innovation spaces which include Social Innovation, Talent Development, and Entrepreneurship and will serve as socio-economic development factors that could influence the success of the Aruban creative industry and

knowledge economy now and in the future. These three factors have significantly been a matter of concern for many years, bearing in mind the common complaints of Aruba's brain drain dilemma, high difficulty and cost of doing business, and an array of social challenges amongst the people.

Lastly, Aruba together with many other countries is committed towards implementing the Sustainable Development Goals (SDGs). Considering the advances Aruba is experiencing, this research could enable further comprehension in areas such as innovation, industry development, economic growth, social inclusion and well-being, education, policymaking and governance within the Aruban context. Conducting this research could aid all stakeholders with further policy strategies for continuous development of all the SDGs, especially; SDG 8 "Decent Work and Economic Growth", SDG 9 "Industry, Innovation & Infrastructure", SDG 11 "Sustainable Cities and Communities", and lastly, SDG 17 "Partnerships for the Goals". Considering the research relevance and purpose, the research objectives of this thesis are to:

- (1) Assess the feasibility of a potential synergy between the creative industry and knowledge economy as drivers of innovation on Aruba,
- (2) Identify the stakeholder perspectives on innovation and what strategies are necessary for successful innovative development and policy making on Aruba,
- (3) Provide policy recommendations that could accelerate innovation through the creative industry and knowledge economy,
- (4) Contribute to the sustainable development of Aruba through implementation of the SDGs.

1.3 Research Question

To meet the aforementioned objectives, a main research question has been formulated accordingly. It is expected that the answer to this research question will create more cohesiveness in implementing innovative policies and projects on and within the creative industry and knowledge economy in Aruba. The main research question is as follows:

To what extent can a synergy between the creative industry and a knowledge-based economy, implemented within a Quadruple Helix Innovation Model stimulate sustainable socio-economic development in the local innovation system of Aruba?

The attention on the socio-economic development is derived from looking at innovation in a more holistic perspective rather than focusing solely on technological change. With the purpose of answering the main question, two sub-questions have been formulated. These questions aim to investigate social perspectives from all stakeholders involved within the Quadruple Helix

Innovation Model, as well as potential strategies that could assist these stakeholders into making Aruba an innovative island and an example in the Caribbean region. These sub questions are:

- 1a. How do the stakeholders position themselves in the synergy of a creative economy and knowledge economy through innovation?
- 1b. How do the stakeholders position themselves regarding the Quadruple Helix Innovation Model and the remaining socio-economic development factors through innovation?
2. What policy measures could help sustain the synergy through the Quadruple Helix Innovation Model as a driver to stimulate innovation?

1.4 Research Method

Following the dynamisms of a case study, Aruba as a small island state is the focal point of this study. Through a mixed method approach, the Q-methodology, has the aim to identify the subjectivity of Aruban stakeholders on the possible policy synergy between the creative industry and knowledge economy. These stakeholders include the representation of government institutions, private agencies, NGOs and the community. A total of 28 respondents participated and contributed to the results of this research. The initial concourse of this study reached a total of 300 statements, from which a Q-sample was narrowed down to 40 statements. Data collection was conducted online with all the respondents. For both the data collection and data analysis, online softwares were used, namely the Q-sortware software and the PQMethod software. From the analysis, specific recommendations are provided to assist Aruban professionals in the initiative to make Aruba an innovative and sustainable island in the Caribbean.

1.5 Research Paper Structure

Following this introduction, the research paper structure consists out of chapters. In chapter 2 the country context of Aruba is elaborated on in detail. This includes data on demographics, the political and constitutional structure, the economic and institutional structure, education and skills development, ICT infrastructure, and lastly, innovation. Furthermore, chapters 3, 4, 5 and 6 focusses on the review of literature on creative industries and knowledge economies and other relevant topics of interest. Moreover, in chapter 7 the chosen methodology is explained and provides an overview of how this research was conducted. In chapter 8, the results of this research are presented, followed by a discussion in chapter 9, where all sub-questions are answered and policy recommendations are specified. Lastly, chapter 10 extends the conclusion and further recommendations for research and practice.

2. Country Context

In the last months of 2017 Aruba experienced a change in government, a coalition between three local parties. Bearing in mind the financial challenges that materialized during the last 10 years, the Cabinet Wever-Croes indicated that innovation would become a policy priority considering the obligation for change and for more socio-economic prosperity on the island. Alongside these financial challenges, Aruba was faced with the reality of having a negative social climate that needs assistance and reformation. According to the OECD (2004) creative industries with bases on knowledge economies could contribute to a more resilient economy in times of crisis (p. 41). Even though the Aruban government has implied that innovation is a necessary catalyst for the future of the island and have made advancements in the introduction of innovation as part of the ministerial agenda, Aruba is merely at the beginning stages of fostering effective innovative development, legislation and policy. In the process of restoring the country, the Cabinet Wever-Croes is focusing on creating a human centered approach to governance and policy making, including even the most vulnerable communities in the Aruban society.

2.1 Demographics

As a small island in the Caribbean, Aruba's population is continuously growing and is estimated to have reached 112.309 in 2019 (Figure 1), which is a 10.7% increase since 2010 when the last census was conducted. In 2019 (1st quarter), the female population counts for 53% and the male population counts for 47% of the entire population. Even though Aruba counts for having 92 different nationalities on the island, the most prominent nationalities are the Dutch, Colombian, Dominican Republic and Venezuelan (Central Bureau of Statistics Aruba, 2019).

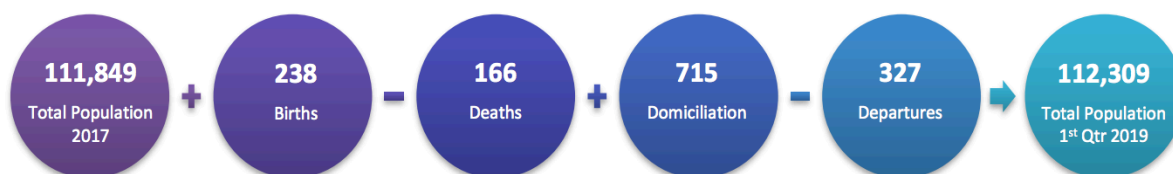


Figure 1. Total Aruban Population 1st Quarter 2019 (CBS Aruba, 2019)

2.2 Political and Constitutional Structure

Aruba is an independent country within the Kingdom of the Netherlands, alongside Curaçao and St. Maarten, together with special municipalities Bonaire, St. Eustatius and Saba. After a long and rigorous plea, in 1986 Aruba received its independent status and was removed from what until 2010 was known as the Dutch Antilles. As Aruba is still part of the Dutch Kingdom, the

reigning monarch of the Netherlands appoints a governor as their representative. Aruba has its own constitution and its political sphere consists out of the legislative, executive, and judicial branch. Jurisdiction in Aruba lies with a common Court of Justice of Aruba and the Netherlands Antilles and a Supreme Court of Justice in the Netherlands. The Aruban parliament consists of 21 members elected by the people every four years. The party (or parties) obtaining legislative majority in these elections are asked by the Governor to form a 7- member Council of Ministers vested with executive powers and headed by a Prime Minister. For the first time in Aruban history, in 2017 the first female Prime Minister, mr. Evelyne Wever-Croes was elected into office. However, it is important to mention that although Aruba has a separate status, it still retains strong economic, cultural, political, and defense ties with the Netherlands and her ‘sister’ islands. In fact, while matters such as aviation, customs, immigration, communication, and other internal matters are handled autonomously by the Aruban government, the Kingdom is still responsible for defense, citizenship, and foreign affairs. In the Caribbean, Aruba is ranked the most effective government in 2017 (Figure 2). This also highlights Aruba’s initiative together with Estonia on becoming a leader on e-government in the region.

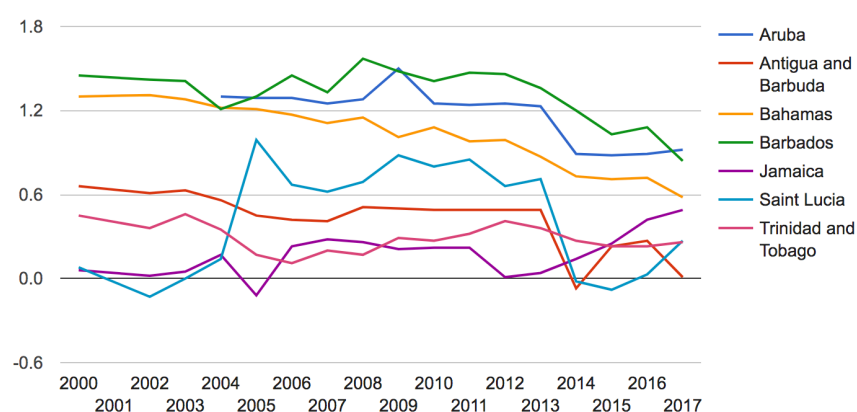


Figure 2. Government Effectiveness Index. Source: The World Bank (The Global Economy, 2019)

2.3 Economic and Institutional Structure

Aruba, the same as the other Dutch Caribbean countries within the Dutch Kingdom, has passed through several economic transitions, from the pre- to the post-industrial era: (1) Nomad society, (2) Agriculture colonial slave economy, (3) Industrial economy, (4) Information economy, (5) Knowledge economy and Creative Economy (Goede, 2009). The 21st century is proclaimed as a systemic century, meaning that highly developed countries will advance even further than developing countries in every aspect. The creative industry and knowledge economy

are essential for preparing current and future generations to catch up. Not doing so leaves developing countries, and SIDS especially, even more vulnerable than they already are.

Economy

The Aruban economy is currently highly dependent on the tourism industry considering that it has been providing the largest percentage of the country's income since 1959. Despite economic setbacks with the gold mining and aloe industry in the early years, Aruba's oil industry has provided great means for national income since the Lago Oil & Transport Company in 1929 and has contributed immensely towards job provisions for Arubans and people from neighboring countries until recently. For the last couple of years, the oil industry has been a continuous struggle and is not contributing to the Aruban economy in the same manner it used to. Although the island lacks nutritious soil and has had low rainfall over the last couple of years, other agricultural prospects including; aloe cultivation, livestock, and fishing still contribute to Aruba's economy. According to the Central Bureau of Statistics Aruba (2019), Aruba's GDP in 2017 accounts to 5,471 million Aruban Florins, while the debt to GDP accounts to 76%. This raises immense concerns for the economic condition of the country and its social welfare. On all islands, tourism-related economic activities, accommodation and food serving, trade and, to a lesser extent, construction, play an important role in the economy.

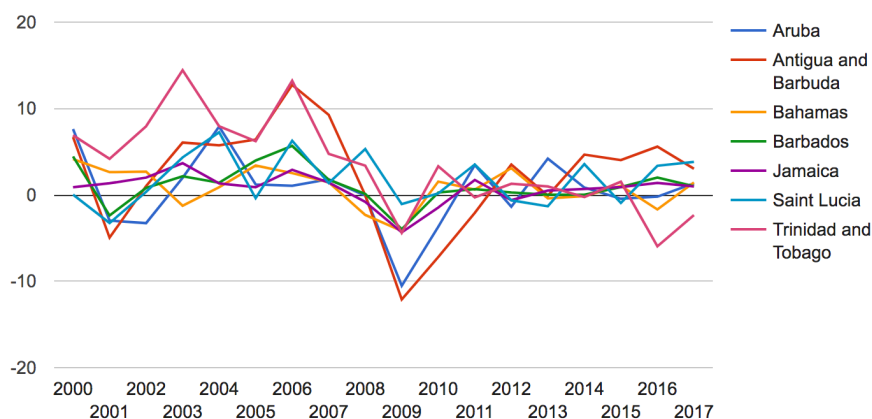


Figure 3. Economic Growth. Source: The World Bank (The Global Economy, 2019)

In addition, Aruba exports art and collectibles, machinery, electrical equipment, and transport equipment. In 2018, Aruba's total exports in the 4th quarters accounts for 34.4 million Aruban florins, while its imports reached 599.7 million Aruban Florins. The top export countries between 2000-2018 were the Netherlands, Colombia, Panama, Venezuela, United States (the highest in the last years), Netherlands Antilles, Curaçao, Belgium, Costa Rica, China, Jamaica,

Surinam, Mexico, Taiwan, France, and the United Kingdom. According to the World Bank in Figure 3, Aruba's economic growth patterns across countries in the Caribbean are similar. In 2017, only Antigua and Barbuda, Barbados, Saint Lucia and Jamaica were ahead of Aruba.

Foreign Direct Investment

According to the report "Foreign Direct Investment in the Caribbean: Trends, Determinants and Policies", "the economic crisis has affected the Caribbean more than most other developing regions. This has been reflected in the level of FDI inflows: while Latin America and most other developing countries quickly recovered the level of FDI that they were attracting before the crisis, economies in the Caribbean covered in this report received substantially less inflows in 2011 or 2012 than in 2008. Because transnational corporations are responsible for a large share of investment, exports or formal employment, diminished FDI inflows can have a high impact on the capacity of these countries to grow and develop" (de Groot & Pérez Ludeña, 2014, p. 17).

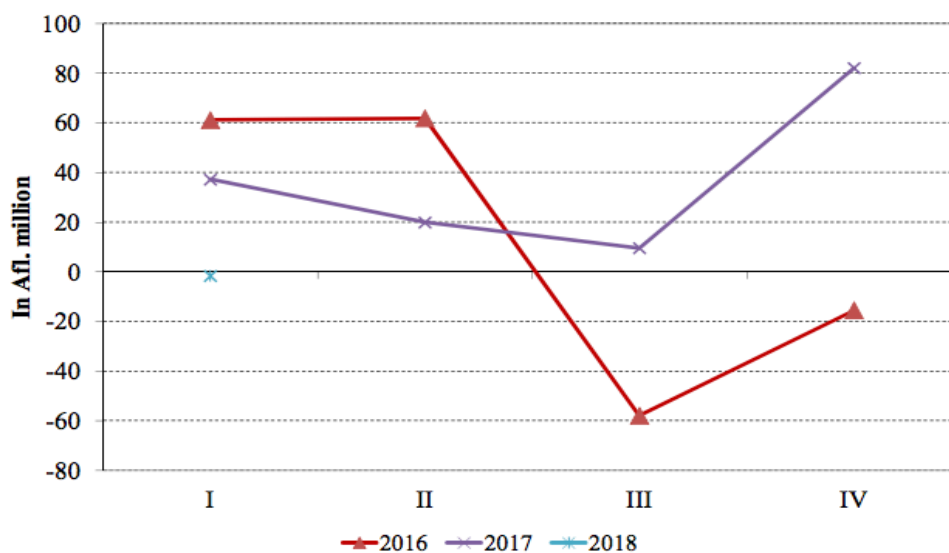


Figure 4. Foreign Direct Investment (Central Bank of Aruba, 2018)

Figure 4, from the Central Bank of Aruba illustrates that in 2016 between the 1st and 2nd quarter FDI was around 60 million Aruban florins and decreased heavily to -60 million Aruban florins in the 3rd quarter and -20 million in the 4th quarter. In 2017, it increased again to 40 million Aruban florins in the 1st quarter and kept increasing to 80 million in the 4th quarter. These shifts in the FDI can be explained by the fluctuating activities in the oil refinery industry on Aruba related to the CITGO fuel industry company and the Venezuela crisis. However, in Figure 5, the scope is broadened slightly and it is clear that FDI in the Caribbean is not very prominent. In 2017, Antigua and Barbuda, Bahamas, Barbados, Jamaica and Saint Lucia are leading in this indicator.

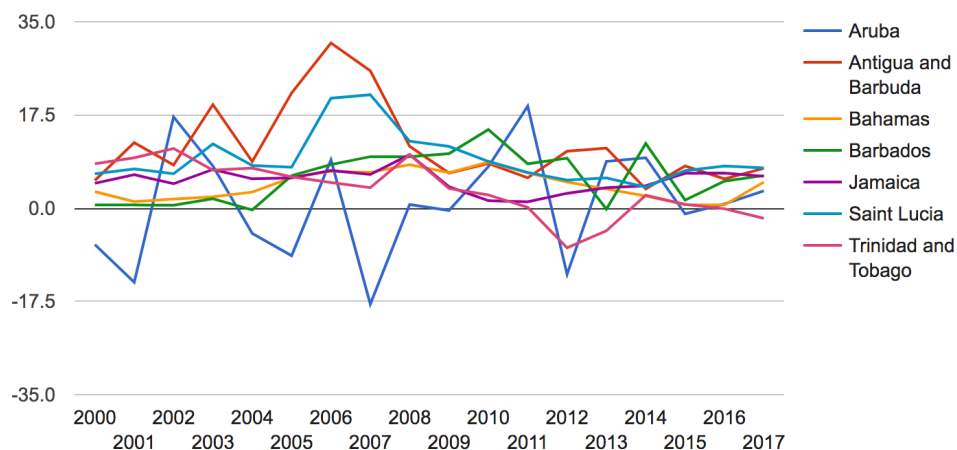


Figure 5. Foreign Direct Investment (%). Source: The World Bank (The Global Economy, 2019)

Financial Institutions

When Aruba obtained its autonomous status on January 1st 1986 within the Kingdom of the Netherlands, the Central Bank of Aruba (CBA) started its operations. “The CBA is a legal entity in itself (*sui generis*) with an autonomous position within Aruba's public sector. With the inception of the CBA, the Aruban Florin was brought into circulation” (Central Bank of Aruba, 2019). As of June 2019, the CBA introduced Aruba’s new banknotes series reflecting not only natural but also cultural heritage elements, making Aruba’s bills unique. These new bills will also hold the highest standard for quality and security. Locally, Aruba has five banks situated on the island, which are; Aruba Bank N.V, Caribbean Mercantile Bank N.V, Banco di Caribe N.V, RBC Royal Bank N.V, and the CIBC First Caribbean International Bank N.V.

Labor Market

In the report “Labor Force on the Dutch Caribbean Islands” by Hermans & Kösters (2019) in 2016 the Aruban labor participation was listed as 61.9%, the unemployment rate was 7.7%, while the youth unemployment was 17.9%. According to the Central Bureau of Statistics of Aruba (2019) unemployment rates increases in 2017 reached 8.9%, and decreased in 2018 to 7,3%. Furthermore, youth unemployment increased in 2017 reaching 19.4%, while decreasing in 2018 reaching 16.2%. In 2017, “the OECD average of youth unemployment stood at 13 percent; in the Netherlands and in the United States, this was 9 percent (OECD, 2018). Youth unemployment on the Dutch Caribbean islands is well above this average” (p.13). For all islands, unemployment is highest among the low-educated, followed closely by those with an intermediate level of education. The gap with highly educated people is great. Where unemployment among low-educated people varies between 7 and 21 percent, this is between 2

and 8 percent for highly educated people. Some explanations for this are that highly educated people who do not find work leave the islands to work elsewhere, but also, for example, that highly educated people on the islands occupy low-skilled jobs. These contextual socio-economic indicators of the current Aruban labor market situation create enough room for comprehensive research and targeted policy making and analysis.

Intellectual Property Rights

Since 1986, the 'Bureau Intellectuele Eigendommen' (BIE) (Bureau of Intellectual Property of Aruba) has been the governmental agency in charge of all matters concerning the registration of intellectual property in Aruba. Data on patent registrations and applications on Aruba are currently not publically available on their website (Bureau of Intellectual Property of Aruba, 2017).

2.4 Education and Skills Development

Aruba's school system, like most Dutch Caribbean islands, follows the Dutch educational system. Even though Aruba has two official national languages, Dutch and Papiamentu, in Aruba the language of instruction for the most part is in Dutch. Currently, Aruba has been taking a multi-lingual approach to education, taking into account Aruba's wide demographic scope. This approach will allow all students from the 1st grade to learn the four most spoken languages in class, which are; Papiamentu, English, Dutch and Spanish. Primary education is divided in pre-school education and regular primary education. General secondary education is divided in four categories, namely, EPB (vocational education), MAVO (general secondary education), HAVO (higher secondary education), and VWO (pre-university education). There is also a public school for students with special needs, specifically, the SPO. Primary education has the highest number of students (35% of student population of Aruba), while in secondary level, the general education MAVO has the highest number of students (14% of student population of Aruba) (Department of Education Aruba, 2019). Besides public subsidized schools, there are private alternatives such as the International School of Aruba (ISA) and De Schakel.

Universities

Aruba has two higher education institutions that are subsidized by the government, which are; the University of Aruba (UA) and the Instituto Pedagogico Arubano (IPA) (higher vocational educational institution). Higher education in Aruba counts for 3% of the total student

population of Aruba (IPA, 1% and UA, 2%). The IPA educates students to become teachers at pre-school, primary school and secondary school level. The UA is a modern university offering higher education, research and social services to Aruba and the surrounding regions. The UA consists out of four faculties, which are: The Faculty of Law (FdR); the Faculty for Accounting, Finance and Marketing (FEF); the Faculty of Hospitality and Tourism Management Studies (FHTMS); the Faculty of Arts and Science (FAS). The UA also has a pre-university certification program, Academic Foundation Year (AFY), which is designed to provide a general foundation for students that are considering following higher education. As of 2019, the UA will add its fifth faculty, the Sustainable Island Solutions through Science, Technology, Engineering & Math (SISSTEM) in collaboration with KU Leuven and will be funded by the United Nations Development Program (UNDP). The SISSTEM faculty will provide Bachelor, Master, and PhD programs related to innovation and sustainability studies. Besides public funded universities and higher education institutions, there are other private international universities located in Aruba, which are; Xavier University School of Medicine and Aureus University School of Medicine.

Women in Education

From the report 'Enseñansa na Aruba: Relato Estadístico 2016-2017' (Education in Aruba: Statistical Report 2016-2017) in 2016, females represent approximately 50% of the total student population of Aruba. However, looking at relevant sectors such as the science & technology department at the EPI, only 10% of the 337 students in 2016 are female, thus a low female participation rate in the sciences. On the other hand, looking at female participation in higher education, in 2016 this reached 67% at the University of Aruba and 94% at the IPA, thus a high female participation rate in remaining fields.

Vocational and Technical Learning

In the secondary level education, the EPB (basic professional education) and the EPI (intermediate professional education) provide vocational and technical learning. At the EPB, there are three units, namely, the technical unit, the service unit, and the economics unit. In this case, the technical unit is focused on the skills relevant for the knowledge economy, while the service unit is focused on some skills relevant for the creative industry (e.g. gastronomy and fashion). At the EPI, there are four units, namely, the science & technology (S&T) unit, the economics unit, the hospitality & tourism (H&T) unit, and the healthcare & service (H&S) unit. In this case, the S&T unit is associated to the skills relevant to the knowledge economy, while the (H&T) unit associated to some skills relevant to the creative industries. Besides these two

institutions available, other options such as Openbare Avondleergangen Aruba (OAA) (public evening education) are also available for students who want to pursue their education in the evening.

Lifelong Learning

Aruba has numerous private institutions providing educational programs to the community, ranging between skill and language development. However, the University of Aruba besides providing higher education for enrolled students, invests into the development of the Aruban society to enable growth through the Center of Life-long Learning (CLL) by including but not limited to: (1) lectures, (2) post academic courses, (3) tailor-made training, (4) seminars and symposia, (5) workshops, and (6) short courses including summer courses (University of Aruba, 2019).

2.5 ICT Infrastructure

According to the 2017 ICT Survey conducted by the Central Bureau of Statistics of Aruba (2017), 77% of the population uses a computer, laptop or tablet daily or almost daily. A total of 69% of youth (people aged 5 till 24 years) uses a computer, laptop or tablet daily or almost daily. A total of 80% of the youth are internet users. When it comes to the elderly, a total 25% of persons 65 years and older use a computer, laptop or tablet. “When comparing the use of any ICT devices by gender, according to the 2017 survey, 65% of the male respondents 65 years and older indicated that they had used at least 1 ICT device compared to 63% of female respondents 65 years and older” (p. 5). The 2017 ICT survey also expresses that almost 70 % of all youth are mobile phone users, while 77% of the total population uses a mobile/smart phone. A total of 53% of all households have at least one functioning computer in the household, while 79% of all households have access to the internet.

2.6 Innovation

In January 2018, ‘Isla Innovativo’, the Central Bank of Aruba presented Aruba’s first innovation report. The intention behind the Isla Innovativo report is to increase innovation investment rates from 2% to 3% of the GDP by 2021. According to the Central Bank (2018), “the need to embrace a flexible innovation framework is critical as global disruption through technological change is taking place at an increasingly faster rate than we ever could have anticipated” (p.7). The approach from this point is to adopt a strategic framework and roadmap that could allow Aruba to reach its desired growth without falling behind. This report has the aim of developing

human-centered policies and best practices that could potentially strengthen Aruba's innovation capacity and increase its economic stability. General goals included to fortify Aruba's current and future innovation capacity, accelerate digital transformation, and to build the future Aruban work force. Isla Innovativo was built on developing purpose-driven economies, stimulating a learning society through knowledge, and facilitating vibrant innovation ecosystem through technology.

The central component of the Isla Innovativo report summarizes the five innovation spaces, serving as policy priority areas, which include: e-Government, Fintech & Regtech, Social Innovation, Talent, and Entrepreneurship & e-Commerce. These innovation spaces are focussed on redesigning the government administrative procedures for efficiency and transparency through the Estonia-model lens as well as by developing a modern state of the art financial infrastructure using break through technology. On the social aspect, the report aims to introduce policies and programs that focus on the well-being of the Aruban people, that work towards changing the current social wave of challenges. Additionally, it has the goal to cultivate and retain talent with a focus on the skills that are needed to foster technical change not only in the economy, but in the Aruban work force as well. Lastly, these innovation spaces intend to foster an entrepreneurial mindset and improve the overall business climate for startups and small-medium enterprises (SMEs).

In 2017, the Central Bank of Aruba conducted Aruba's first State of Innovation Survey, with the intention of exploring factors that are contributing to Aruba's disruptive economy, and to provide policies for unleashing the longed after digital transformation and inclusive growth. This survey provided insight on six challenges Aruba is currently facing on its journey to becoming an innovation catalyst in the Caribbean (see section 1.2). The overall "learning society" roadmap consists out of three phases; Phase 1 from 2017-2021, Phase 2 from 2021-2025, and Phase 3 from 2025 -2030. Aruba is now working on the first phase, which is aimed at enhancing productivity, and will then work developing new business models and ecosystems (Phase 2), and reach the end goal of accelerating growth by exporting knowledge (Phase 3).

In 2018, the Aruba Futura Foundation was established with the purpose to aid in the design, development, and implementation of a national innovation strategy for Aruba. Futura has received the mandate to implement the Government of Aruba's human-centered national innovation plan, named Aruba Innova 2030. Since its debut, Futura serves as the Aruban Government innovation lab and national think-tank and is supported by the innovation team of the Ministry of Innovation, which reports to the Prime Minister of Aruba, mr. Evelyn-Wever Croes.

2.7 Aruba and the SDGs

Since 2016, the Aruban government adopted and has been working on the implementations of the Sustainable Developing Goals (SDGs) by reinforcing the presence of the 17 goals and 169 indicators formulated by the United Nations (UN) within the country’s socio-economic vision and policy making process. Coinciding with the installation of a National SDG Commission, an SDG-Indicator Working Group (SDG-IWG) was installed in January 2017 and is a joint effort between different data producing government departments. The main purpose of the SDG-IWG is to support the Central Bureau of Statistics in leading the process of data collection to monitor and evaluate the SDGs and the integration of the SDGs in national policy (Aruba SDG Indicator Working Group, 2018). Considering the SDG indicator attainment on Aruba (Figure 6), there is tremendous room for the creative industry and knowledge economy to contribute to fulfilling more SDG indicators.



Figure 6. SDG Indicator Attainment on Aruba (Aruba SDG Baseline Report, 2018).

3. The Emergence of the Creative Industry and Knowledge Economy

Over the last century, most economic growth theories have been based on innovation-generating processes focused on the role of productivity, technology change and knowledge, as well as on the role of the actors contributing to them. In the Neoclassical Growth Theory, as developed by Solow (1956) and his followers, economic growth in the long-run is the result, within the industrial sphere, of the combination of capital, labor, and technological progress (considered an exogenous element). Years later, the so-called New or Endogenous Growth Theory proposed by Romer (1986) and Lucas (1988) introduced the “shift from a resource-based economy to a knowledge-based economy. The Creative industries is a relatively new term that signals the growing importance of creativity and innovation in the knowledge economy” (OECD, 2014). However, in order to understand the fundamental properties of the true influence of these economies on socio-economic development, these concepts should be clearly defined and explored.

In the following chapters, the primordial focus will be on defining the creative industry and knowledge economy, while assessing the synergy between these two economies. Also, this review will explore the connection of these economies to concepts such local innovation ecosystem, and how this relates to sustainable development on SIDS. Also, it will review some socio-economic development indicators that are correlated to three of the five innovation spaces, which are; talent, social innovation and entrepreneurship. Lastly, to provide a more strategic approach, policy measures are explored to sustain the concept that these two economies could thrive within the QHIM model.

3.1 The Creative Industry

Creativity has recently become a very popular term over the years. In one sense, this focus is obvious, because which person, group, firm, city, or country would aspire to be 'uncreative'? However, Jeffcutt (2004) states that the “recent enthusiasm for creativity needs to be put in context, and in particular connected to strategic responses by governments and corporations to competitive and globalized challenges (Porter, 1990; Castells, 1998) in the contemporary economy” (p. 67). When it comes to the concept of creative economy, according to Peters (2010) both the emergence and policies related with to the creative industry originate in the late '90s and early 2000s in the efforts of Charles Landry, John Howkins and Richard Florida. This concept has been applied to education at all levels in terms of the development of creative

minds, the creative curriculum and universities as creative institutions. Specifically, the creative industry, as a phenomenon of economic development in the post-industrial world, according to Veselá & Klimová, (2014) “offers an alternative type of growth, even in the economic crisis, thanks to the so-called “creative class”. This class’s emergence has been mentioned by Florida (2002), among others, who assigned it a significant economic function – the creation of new ideas, technologies and creative content” (p. 415).

The role according to Dubina, Carayannis & Campbell (2012) the use of creativity as an economic resource is undeniable, but there are still doubts about the definition and the analysis of the creativity economy, considering that it is mostly grounded on stereotypes. Generally, creativity should not be categorized as specific class of people, specific industry or industrial cluster. However, Solidoro (2009) expresses that the creative industry is a more holistic definition than what is known as the cultural industry. The creative industry is often associated with being a new economy, that is driven by digital technologies, and which is closely associated to the information or knowledge economy. Furthermore, Solidoro highlights that Metcalfe & Potts (2008) identify the creative industries as core parts of the service economy, and as illustrative of the knowledge economy, the creative economy and special economics. Consequently, they suggest that the creative industry plays a role not only in the production of services, but also in the entire practice of innovation impacting spheres of business, economic, and social life.

Table 1. Definitions Creative Industry

| Source | Definition |
|----------------------------|--|
| Setaynti (2017) | Creative industries are industries producing products and services that can provide added value for the creativity and knowledge. Unlike conventional economic sectors in the global value chain, which rely heavily on capital, raw materials, and location, the creative industries focus on creativity and knowledge. |
| Solidoro (2009) | Creative industry is a broader definition than cultural industries, encompassing the commercial fields of design, advertising, video games, fashion, music, TV, publishing and new media. It is often associated with a “new economy”, driven by “digital” technologies and closely related to the “information” or “knowledge” economy; the different ways of conceptualizing the creative industries are systematic expressions of models emerging over time within different disciplines. |
| European Commission (2017) | The cultural and creative sectors (CCS) include all sectors in which activities are based on cultural values and/or artistic and other forms of creative expression. They include architecture, archives, libraries and museums, artistic crafts, audiovisual (including film, television, video games and multimedia), tangible and intangible cultural heritage, design, festivals, music, literature, performing arts, publishing, radio and visual arts. |
| United Nations (2008) | Creative industries are vast in scope, dealing with the interplay of various subsectors. These subsectors range from activities rooted in traditional knowledge and cultural heritage such as arts and crafts, and cultural festivities, to more technology and services-oriented subgroups such as audiovisuals and the new media. |

| | |
|-------------------------------|---|
| United Nations (2013) | The term creative industry is applied to a much wider productive set, including goods and services produced by the cultural industries and those that depend on innovation, including many types of research and software development |
| UNIDO (2013) | The creative sector refers to aesthetics, identity and goods and services which are underpinned by a full range of intellectual properties. Being knowledge-based, it embodies a wide array of activities that make and circulate sounds, words, and images, design and concepts, or combination of the above in a physical product. It applies to artistic, creative and copyright works that are identifiable commodities, services, traditional heritage and intellectual properties embodied in geographical indications, trademarks, innovative design rights and patents. In short, the term cultural or creative industries describes the value chain of economic activities of creative enterprises and cultural entrepreneurs, for-profit as well as for non-profit. |
| Jeffcutt (2004) | Those activities which have their origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property. These have been taken to include the following key sectors: advertising, architecture, the art and antiques market, crafts, design, designer fashion, film, interactive leisure software, music, the performing arts, publishing, software, and television and radio |
| Government of Aruba (2019) | The development of Creative Industries in Aruba will entail Art & Music, Graphic design, Photography, Web design, Art studios and Fashion |

According to the OECD (2014) the shift from so-called cultural industries to the broader creative industries “signifies a number of important changes in the way culture and creativity are viewed, which include: a broader understanding of culture and artistic activity; the increased importance of creativity; innovation and skills in economic development; changes in consumption and demand patterns; the repositioning of culture from being elitist and exclusive to being more creative, democratic and inclusive; viewing the production of culture as a sector rather than a separate industrial activity; and a shift from subsidized arts towards commercial creativity” (p. 32-33). Furthermore, in previous research by Franken (2018) in short, “Van der Borg and Russo (2015) indicate that culture can be considered a driver for a new stage of development of cities based on quality of life, conviviality, creativity as elements of distinction of cities, at the same time guaranteeing balance to such development. Clarifying the importance for cities to invest in culture, heritage management and preservation, art production, events and infrastructure, and jobs and creative education” (p.17). Interestingly, Cooke & De Propris (2011) investigate Chapain et al. (2010) who looked at the capacity for innovation of the creative industry and discovered that it is more innovative than many other high-innovation industries, especially knowledge-intensive sectors (e.g. research, financial, and legal services).

Furthermore, Jeffcutt (2004) in the paper “Knowledge Relationships and Transaction in a Cultural Economy: Analysing the Creative Industries Ecosystem” identify the operational connectivity within the creative industries ecosystem. Jeffcutt proposes that the creative industries are trans-sectoral, trans-professional, and trans-governmental. The creative industry is trans-sectoral because it is formed through the interconnection of sector. Also, they are trans-

professional because it formed through the interconnection between diverse creative niche markets (i.e., visual art, craft, print, video, music, etc.). Finally, the creative industry is trans-governmental in that it requires an inclusive and participatory network of stakeholders. The results of such a multi-layered operational connectivity becomes complex and challenging, especially when policy makers are trying to stimulate the effective connectivity between the industries and the whole economy, considering the diverse range of activities all of which have creativity at their core and produces a terrain with a very mixed economy of forms from freelancers and micro-businesses to trans-national organizations encompassing the range from sole artists to global media corporations.

Table 2. Models of Creative Industries and associated concepts (OECD, 2014)

| Model | Description | Implications |
|--|---|---|
| Sectoral Model | Creative industries are viewed as an economic sector with distinctive value chain and important economic impact. The original approach was taken by the United Kingdom. Many other countries have adopted this approach, including Australia, Canada and Germany. | A focus on specific sectors that are relatively easy to identify and measure. May potentially strengthen the existing divisions between sectors and inhibit an integrated approach. |
| Concentric Circles Model | Creative ideas originate in the “core creative arts” and then disseminate outwards to the “borderline” and “peripheral” cultural industries. Model originally developed by Throsby (2001) and extended by The Work Foundation (2007). Originally used by academics, now more widely adopted by policy makers. | Identifies the creative content and “expressive value” involved in different creative activities and identifies the symbolic value of creativity. Poses the problem of adequately defining expressive value. |
| Symbolic Texts Model | Cultural Industries essentially concerned with production of social meaning through the production and circulation of texts. Mainly used by academics. | Illustrates the very wide scope of creativity, which includes many functions outside the cultural industries themselves. |
| Intellectual Property and Copyright Model | World Intellectual Property Organization (WIPO) model of the “copyright industries” involved in the creation, manufacture, production, broadcast and distribution of copyrighted works or intellectual property (IP). Used to estimate the economic value of the copyright industries. | Allows the value of copyright sales to be calculated, but not all creative industries deal with IP, so has limited scope |
| UNESCO Model | Based on international trade in cultural goods and services. Used to calculate the export value of trade in cultural goods. | Provides a clear measure of the export value of cultural goods and services and therefore a useful tool for export-orientated policies. Provides limited coverage of creative sectors, and does not consider tourism-related exports. |
| Americans for the Arts Model | Based on the identification of creative sectors related to the arts. Mainly used as a lobbying tool by the arts sector. | Relates very clearly to arts policy, but ignores links with technology, computing and other creative sectors. |

| | | |
|---------------------------------|--|--|
| Experience Economy Model | The concept of the “experience economy” developed by Pine and Gilmore (1999) has been linked with the creative industries, particularly in the Nordic countries. Sweden and Finland have developed this concept extensively (The Knowledge Foundation, 2006; Tarssanen, 2009). | The experience industry concept is very heterogeneous and difficult to operationalize. The Swedish Agency for Growth Policy Analysis (2009) recently suggested abandoning the term in favor of “creative industries”. |
| Social Network Model | Potts et al. (2008) produced “a new social network-based definition of the creative industries” that shows how the creative industries create value by circulating new ideas within networks. Used by academics. | Emphasizes the importance of networks in innovation and value creation, providing a link to social policy as well. May be difficult to operationalize. |
| Employment-based Model | UNESCO (2009b) and the Centre of Excellence for Creative Industries and Innovation at Queensland University of Technology (Box 2.2) signal a move away from Standard Industrial Codes towards occupational-based definitions. Also, embedded in the “creative trident” model. | Occupational data provide a more accurate measure of value added and growth in the creative industries. Underlines the value of the creative industries for the whole economy. |
| Creative Domains Model | The UNCTAD (2010) approach is wider than narrow cultural or arts definitions, and explicitly recognizes more commercial and intangible forms of creativity as related to the creative industries. This model has been used as the basis of many other studies, particularly in developing economies. | Provides a very broad umbrella that has the potential to bridge the gap between cultural and creative industries policy. May lack focus for some policy purposes. |
| Creative Talent Model | The NESTA (2013) Manifesto for the Creative Economy identifies “creative talent” as the distinguishing feature of the creative industries. Further develops the United Kingdom’s Department of Culture Media and Sport (1998) definition. | The focus on talent recognizes the convergence of different creative sectors and provides a useful link with models of the “creative class” or the “creative city”. However, creative talent is found across a wide range of industries, leading to a potential loss of focus. |

With many countries aiming to stimulate socio-economic growth and job creation, the creative industry has proven to be an appealing driver for policy makers. The creative industries deliver a broad range of benefits, including (1) producing economic growth, exports and employment, (2) inspiring innovation, (3) increasing intellectual property, (4) encouraging education and training, (5) diversifying national and regional economies, (6) developing linkages to tourism, (7) reinforcing cultural identity and diversity, (8) creating beneficial externalities, (9) addressing market failure and imperfect competition by motivating the production of public commodities, and (10) promoting R&D. While these benefits are pronounced, Setyanti (2017) indicates that there are eight factors driving the creative industry, which are; “demand, greater diversity, a level playing field, education and skills, networks, public sector, intellectual property, and building greater business capacity” (p. 90).

In addition to providing job opportunities for youth and women, creative industries may also contribute to a more resilient economy in times of crisis. Seemingly, Hendrickson, Lugal,

Perez Caldentey, Mulder, & Alvarez (2012) from ECLAC confirm that Caribbean economies are facing a challenging period in their development. The current cause of the weak performance has been the limited structural transformation of most Caribbean economies. Insufficient resources have been allocated to upgrading traditional sectors to increase their added value, such as agriculture or even tourism. Thus, in the search for new growth sectors to diversify the economic sector, Caribbean policymakers have been paying increased attention to their creative industries. The economic development of SIDS is exposed to several limitations compared to other developing countries and developed countries. The SIDS's geographical and demographical sizes prevents equal leverage of economies of scale, which then increases unit production costs of economies such as agriculture and even manufacturing. With this, SIDS have been challenged in moving up the value chain in traditional export. Other economic limitations for SIDS include; limited natural resource endowments and labor supplies, and high transportations costs, which in return make trading difficult.

According to ECLAC (2012), there are numerous reasons why a creative industry is beneficial for sustainable socio-economic growth in small island states in the Caribbean: (1) creative industries are based on talent and creativity, which are not only renewable, but are the source of innovation and new content; (2) creative industries might be less dependent on the size of the economy and less vulnerable to external shocks, compared to other sectors such as agriculture, tourism and the oil refinery economy; (3) creative industries have a great potential to create good quality employment opportunities; (4) the sector mixes within a creative industry allows for both arts/ heritage related activities and more technological activities, which connects technological innovations with social innovations with each other; (5) creative industries also utilize a great amount of domestic capital; lastly (6) since the Caribbean mainly exports primary products, creative industries could alleviate the balance of payments constraint by increasing export productivity. However, even though creative industries offer tremendous leverage opportunities for island states in the Caribbean, there are still some constraints that could be challenging in the development of a creative industry, which include; product/service development, cost of and access to financing, innovation capacity and productivity, education and training, export promotion, intellectual property development and management, and data collection and management. According to the United Nations (2013) the Caribbean is "highly competitive in cultural production and many of its artists and events have a global reach that extends well beyond the region. It has been argued, however, that there remains an institutional and commercial bias against indigenous creative content in the home market, discouraging creative entrepreneurship, investment and market development" (p. 82). Nevertheless,

Hendrickson, Lugay, Perez Caldentey, Mulder, & Alvarez (2012) believe that the Caribbean has great potential in numerous niche markets of the creative industry. A comprehensive competitiveness mapping analysis of the sector would indicate which segments are most dynamic per country. To exploit these benefits, “countries could then take the strategic decision to target scarce resources into their most competitive niches, rather than trying to promote many subsectors for export. The potential of these sectors, however, would have to be converted to real gains by an integrated package of production and trade development, financing, human resource upgrading, marketing and other policies. It is now for policymakers and firms in the sector to rise to this challenge” (p. 58-59).

The Four Models of the Creative Industry

An interesting concern of many professionals in the creative industry and economist relies on the arguable unknown dynamic between the creative industry and the rest of the economy. In 2008, Potts and Cunningham defined four models of the creative industries: (1) the welfare model, (2) the competition model, (3) the growth model, and (4) the innovation model. Many have tried to statistically prove the economic relevance of the creative industry, however according to Potts & Cunningham (2008) it has no basis in economic theory. In their eyes, “it is a matter of political expediency to afford an industrial sector policy attention in proportion to the share of income (or jobs, or foreign exchange) it generates, not a matter of economic logic” (p. 235).

As illustrated in Table 3, model 1, the welfare model, the creative industries are hypothesized to have a net negative impact on the economy, such that they consume more resources than they produce. “A dynamically equivalent statement is that the rate of total factor productivity growth is less in the creative industries than in other sectors” (p. 235). The creative industry is perceived as an economic drain, due to the production of activities/products of high cultural value, but at the same time low market value. This can be argued as a market failure, but the constant dilemma is whether it is justified or not.

Additionally, model 2, the competition model, as a standard microeconomic concept differs from model 1 in allowing that the creative industries are “not economic laggards, nor providers of special goods of higher moral significance, but effectively ‘just another industry’: in effect, the entertainment or leisure industry” (p. 236). Model 2 also assumes that the growth impact is neutral, in such a way that the aggregate creative industry would in contribute not more or less to technological change, innovation or productivity growth than the average of other sectors in the whole economic sphere. Considering the position of the creative industry in this

model, it should then “require the same policy treatment as other industries. The creative industries, in this view, are just another member of the industrial community, and they should rightfully then demand neither more nor less ‘assistance’ than that due to others” (p. 237).

Furthermore, in model 3, the growth model, the creative industry is a growth ‘driver’ in the same way that agriculture was in the early twentieth century, elaborately transformed manufacturing was in the 1950s, and ICT was throughout the 1980s. According to Cooke & de Propris (2011), “a resilient economy requires a growth agenda that is underpinned by a balanced industrial mix, the development and adoption of new knowledge or technological platforms, and risk taking in radical and incremental innovations as well as in soft and hard innovations” (p. 365). Meaning, the promotion of a sustainable and endogenous way of ‘resetting’ the economy is desirable, and can be endorsed through a growth agenda that includes a creative and cultural industry. Unlike the first two models, the creative industry is part of the entire growth model of the economy through supply and demand. In this notion export of new ideas go from the creative industry to the economy, while the increasing growth in the economy causes an increased demand within the creative industries. Another difference between model 3 and the previous model is that in this situation the creative industry should get proper treatment policy-wise as a ‘special economic sector’, not because of its own significance, but because it empowers the other economies in a country.

Lastly, in model 4, the innovation model, rather than thinking of the creative industries as an “economic subset driving growth in the whole economy, as in model 3, the creative industries may not be well characterized as an industry per se, but rather as an element of the innovation system” (p. 238) within the entire economic sphere. Specifically, according to Potts and Cunningham (2008) “this is the same model as proposed for the effect of science, education and technology in the national systems of innovation approach. The creative industries, in this view, originate and coordinate change in the knowledge base of the economy. In consequence, they have crucial yet not a marginal policy significance” (p. 238). Thus, for a policy synergy between the creative industry and knowledge economy to be feasible, the creative industry should operate within the fourth model: the innovation model. Culture is indeed a public good, but for dynamic not static reasons. Unlike the value of museums or classical arts, which seek cultural value through the maintenance and preservation of past knowledge, the creative industry’s value lies in the development and adoption of new knowledge, and in turn, innovation. Summarized, in model 1, “the economy drives CI through transfers of resources. In model 2, the creative industry is just another industry. In model 3, CI drives the economy through high rates

of growth. In model 4, the creative industry advances the economy through transfers of knowledge” (p. 239).

In conclusion, Solidoro (2009) seems to confirm that the creative industries have evolved in parallel with the field of innovation studies, from cluster initiatives and innovation networks to open innovation and user-driven innovation. For this reason, the leading-edge activities within digital sectors of the creative industries function as the Research and Development for the creative industries at large, as well as for other industrial economies. The user-driven innovation approaches, as illustrated in Solidoro’s article, together with digital media, are forging a new, more dynamic and innovative value chain for the production, distribution and consumption of creative content and services, and are drivers of “open innovation” as well as transformation for business and organizational models (p. 20).

Table 3. Four Creative Industry Models (Potts & Cunningham, 2008)

| Model | Characteristics | Value | Relationship with other Sectors | Policy Instrument |
|------------------------------|--|---|--|------------------------------|
| (1) Welfare Model | The Creative Industry consumes more resources than it produces. | Important for social, political and cultural reasons. | Transfer of resources from elsewhere in the economy. | Welfare subsidy instruments |
| (2) Competition Model | The Creative Industry is just another industry. | Not economically negative, nor providers of special goods of higher moral significance (e.g. the entertainment and leisure industry). | A change in the size or significance of the creative industry has proportionate (but structurally neutral) effect on the whole economy. | Standard Industry Policy |
| (3) Growth Model | The Creative Industries is a driver of growth. | Introduces novel ideas into the economy that then permeates to other sectors, or facilitates the smoother adoption of new ideas or technologies in other sectors. | Positive economic relationship between growth in the Creative Industry and growth in the whole economy. | Investment and Growth Policy |
| (4) Innovation Model | The Creative Industry is an element of the innovation system of the whole economy. | Complex evolving system deriving its economic value from the process of innovation. | Contribution to new ideas and technologies, and consequently to processes of change. Change in the Creative Industry may produce structural change in the economy. | Innovation Policy |

3.2 The Knowledge Economy

Nowadays, post-industrialized economies are increasingly relying on their innovation capability in the knowledge economy to continue growing into the 21st century. Countries and policymakers are therefore seeking to understand how innovation can be fostered to secure growth and jobs. In the eyes of Veselá & Klimová (2014), “while in the past knowledge was not

considered to be a main source and a driving force of economic growth and the raising of the standard of living, in the 20th century society started to realize its importance, and it has since become an integral part of economic theories and models. The economies of all developed countries are currently based on knowledge and information, and therefore they are referred to as knowledge economies” (p. 414). According to the economic policy for 2019-2022 by the Government of Aruba (2019), “the subsectors to be developed under knowledge economy are: (1) Solar Energy, (2) Ocean technology for Cooling, (3) Higher Education for export, and (4) ICT Island Based Solutions based on efficiency and innovation for export” (p. 44). For most of these subsectors the intention is to develop new technologies, adopt them locally to tackle local challenges on the island and to showcase these solutions as export services. Knowledge involved in innovation processes has become more and more complex, and ever-more widely distributed amongst different types of actors, firms, universities, public sector research organizations and individuals (Parmentier & Mangematin, 2012). What many call the “knowledge economy” is a major area of focus for governments, as economies are increasingly dependent on the production, distribution and use of knowledge in the 21st century. Especially considering the pressure SIDS endure to remain competitive and resilient to external shocks. The use of knowledge and the incorporation of creativity is now inevitable taking into account the vector of growth across all sectors of the economy and to attract business opportunities, investment and a highly skilled workforce.

Generally, the loose correlation between these two economies has been indicating possible synergy strategies in remarks to policy solutions. In the eyes of Persaud (2001), “the knowledge revolution has already started to make life difficult for developing countries as cutting-edge technology sectors compete with emerging markets for access to risk capital. Indeed, over the past five years, returns have been far higher for the technology sector of world markets than for emerging-market equities; more than 90 per cent of the global technology sector is in developed countries” (p. 115). In the opinion of Goede (2009) the knowledge economy “is characterized by connecting power to share data and information faster and further. Technology enables us to tap into each other’s creativity. The knowledge economy is the result of bringing together powerful computers and well-educated minds to create wealth” (p. 48). Knowledge and technological capabilities required to innovate are often highly distributed amongst actors involved in different communities and industries. Innovation takes place within firms that are exchanging information and technological innovations, or is based on the acquiring external technologies or co-developing them with other firms. Parmentier & Mangematin (2012) stress that “collaboration with other organizations (firms, universities,

research labs, etc.) makes it possible to gain access to unavailable information in order to increase a company's in-house knowledge via a collaborative learning process in an interconnected organizational network” (p. 4).

According to Dyker & Radosevic (2000) “knowledge-creating activities are undertaken both through formal R&D activities (mainly in firms and their R&D labs; universities, and other public or private R&D organizations) and through non-R&D activities (in the engineering and production departments of firms; in trading organizations; in technology-transfer organizations; and on the part of users). Knowledge diffuses through diverse forms of inter-firm interaction, and by interaction between firms and organizations at other levels, including public-sector organizations. This multi-layered pattern of knowledge generation and distribution is well captured in Matthew’s notion of economic learning” (n.p). Also, knowledge can help governance, and the new knowledge economy places greater emphasis on good governance. Hence, if a country lacks a good knowledge base, it is likely to have poor governance, which in turn will steer capital away. The resulting combination of poor governance and scarce capital will make the development of a knowledge base more difficult (Persaud, 2001, p. 112).

In the knowledge economy creativity is widely promoted as a key resource for securing competitive advantage, yet precisely how firms define and manage this elusive attribute continues to attract diverse opinions (Banks, 2005). Peters (2010) concurs that “there is now widespread agreement among economists, sociologists and policy analysts that creativity, design and innovation are at the heart of the global knowledge economy: together creativity, design and innovation define knowledge capitalism and its ability to continuously reinvent itself” (p. 72). Within the knowledge economy, it is argued that firms are compelled to develop a creative, innovative capacity that can generate new ideas, solutions and products (Florida, 2003). Currently, governments are trying to expand knowledge-based economy policy models and there is a renewed sense of urgency in policy circles for things, such as; innovation, R&D-driven industries, science, and education and training. However, clearly, the role of government in the development of a successful knowledge-based economy needs to be much more than this. Governments should then not only function as facilitators as is common, but need to be coordinators, and provide intellectual leadership and vision, as well as the social and cultural resources for communities so that they are knowledge and communication rich (Rooney, Hearn, & Ninan, 2005, p.5).

3.3 The Economics of Innovation

For centuries, economists were slow in acknowledging the importance of innovation for socio-economic growth. According to Antonelli (2009) “economics of innovation has emerged as a distinct area of enquiry at the crossing of the economics of growth, industrial organization, regional economics and the theory of the firm, and has become a well-identified area of competence in economics specializing not only in the analysis of the effects of the introduction of new technologies, but also, and mainly, in understanding technological change as an endogenous process” (p. 611). Simply, economic growth is not taking place equally among the nations of the world (Verspagen, 1991). In initial economic models, output (Y) was expressed as a function of capital (K) and labor (L), while technology was not considered (equation 1.1).

$$Y = f(K, L) \tag{1.1}$$

It was not until 1957, where Solow in his attempt to explain income distribution difference and economic growth, introduced the notion that increases in capital and labor does not completely account for economic growth. One important factor was missing in this equation, technical change (A), which represents the enhanced productivity of both capital and labor. In this case, technology (innovation) is considered a separate exogenous (independent) added factor (equation 1.2). This is also known as the Cobb-Douglas Function (van den Berg H., 2012).

$$Y = A f(K, L) \tag{1.2}$$

Moving away from this, in 1986 Romer introduced the assumption that technology is not simply an exogenous model, but is the result of explicit effort in a country. The new growth theory modeled technology is considered a result of inputs such as R&D and human capital (HC) (van den Berg H., 2016) (equation 1.3).

$$A = f(R\&D, HC) \tag{1.3}$$

According to the World Bank (2010) the model portrayed in equation 1.4 has worked better for analysis of developed countries than for developing countries for two principal reasons: (1) developing countries do not invest much in R&D; (2) the primary ways in which developing countries produce products or processes that are new to them is by adopting knowledge that

already exists in developed countries. Thus, “these growth equations need to incorporate the imports of capital goods and components, as well as imports more generally, foreign direct investment (FDI), and other channels for accessing existing global knowledge” (p. 41).

$$Y = f(K, L, R\&D, HC) \quad (1.4)$$

3.4 Creativity, Knowledge and Innovation

While, affecting economic, cultural, and societal aspects of sustainable development, these new concepts are creating space for dialogue between communities, the government, academic institutions and the industry. This new movement is recognizing the importance of culture, technology, knowledge and innovation as drivers to encourage economic growth, advocating cultural identity, social cohesion, and heritage preservation (Franken, 2018, p. 16). According to Setyanti (2017) “creativity and innovation have always played a key role in the economy. Currently, in the developing countries, the tangible asset-based economic paradigm have shifted into an intangible asset-based economic paradigm that includes creativity and innovation” (p. 90). On the other hand, Benavente & Grazzi (2017) express that “creativity is a main driver of society’s process of innovation. In fact, creative outputs are unique and disruptive, and they have the potential to inspire people across society, generating ideas and, therefore, innovations” (p. 41).

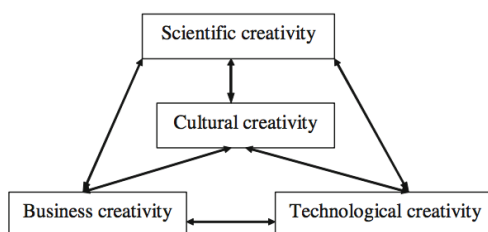


Figure 7. Creativity in today’s economy (Dubina, Carayannis, & Campbell, 2012)

Carafa (2008) underlines that the first economic definition of creativity was made in “Theory of Economic Development” by Schumpeter in 1911. Schumpeter is also considered the catalyst of the concept of creativity linked to innovation through ideologies regarding entrepreneurship. In this case, Schumpeter’s approach to creativity is characterized as a dynamic process of innovation, which is endogenous to the economy and can be explained in rational terms. Also, his definition of creativity is an “economic” one based on the innovation condition and on the role of creativity in economic growth. However, as he emphasized, this does not include “artistic” creativity which is based on original forms of human expression. According to

Dubina, Carayannis, & Campbell (2012), all economic spheres of creativity (scientific, cultural, business and technological) can be economically significant (Figure 7.)

Dubina et. al also highlight the similarities between economic development and creative self-actualization (Figure 8). Based on such a classification, and referring to the well-known Maslow’s pyramid of behavior motivation hierarchy, they consider the economic development stages as those that correspond to societal needs. Creativity in this sense is based significantly on social and personal values (cooperation, trust, etc.), not only economic values (such as profit), and produces an inter-impact on social, political, and cultural life. Additionally, great distinction is made between knowledge-based and knowledge-driven; “(1) Knowledge-based: Knowledge is one of the key means and goals of economic production and exchange, representing a key economic resource with a high degree of utilization and sharing; (2) Knowledge-driven: where knowledge is the major means and goal of economic production and exchange, and the most valuable economic resource under continual renewal, sharing, and utilization” (p. 9)

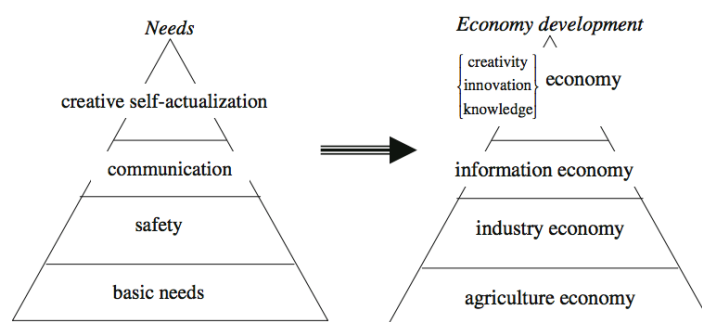


Figure 8. Maslow theory and economic development (Dubina, Carayannis, & Campbell, 2012)

Comparably, creative economies are those that are directly based on mass and constant creativity involvement in the production and distribution of new knowledge, new technologies, new practices, and new contents, and those economies with mass and constant creativity play the predominant role in the creation of wealth and economic growth. From this perspective, it does not make sense to not treat knowledge economy, creativity economy, and innovation economy as interchangeable concepts. The key here also remains in the relationship between knowledge, innovation, and creativity. In Figure 9, the synergy between creativity, knowledge and innovation is illustrated. There is a total of seven possible combinations, which have different interactions with each other, resulting in different scenarios. Also, Table 4 clarifies the combinations including both extremes where all three concepts overlap (3) and where none of the concepts overlap (7). The relationship between creativity, knowledge, and innovation is nonlinear. These components of the new economy are dialectically inter-impacted by each other. Innovation is

crucial for the leveraging and acceleration of knowledge creation, production, diffusion and application in the modern society and economy.

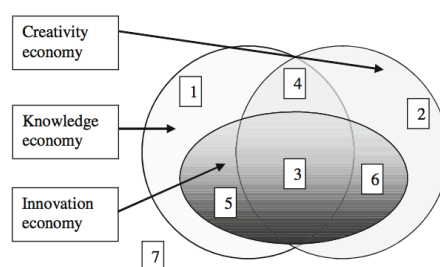


Figure 9. Synergy creativity, knowledge & innovation (Dubina, Carayannis, & Campbell, 2012)

According to Carayannis & Campbell (2011) the creative industry is part of the entire economy and it is reasonable to not only speak of the creative industry but to expansively envision a “creativity economy,” where creativity is applicable for all sectors of the economy as well as all sectors of the society. “An advanced knowledge economy is a knowledge economy, innovation economy, and a creativity economy at the same time. The more mature and advanced a knowledge economy innovation economy, and knowledge society are, the more creativity is being demanded” (p. 340). So, what Dubina, Carayannis, & Campbell (2012) indicate is that “the more advanced and mature a knowledge economy and knowledge society are, the more knowledge, innovation and creativity can be absorbed and are even being demanded for further progress. The creativity economy creatively interrelates technological innovations with social innovations” (Carayannis & Campbell, 2011, p.340).

Interestingly, Dubina, Carayannis, & Campbell (2012) question to what extent knowledge, innovation, or creativity is good or even necessary for the development and evolution of economies and societies. What economic theory has proven over decades is that economic development and progress of society depend on knowledge, innovation, and creativity, and a surplus of knowledge, innovation, and creativity should then drive the economy as well as society. On the other hand, it could also be debated that the more advanced or mature a knowledge economy or knowledge society is, the more or the better a surplus of knowledge, innovation, or creativity can be absorbed and transformed into sustainable development. For developing countries, especially island states, absorptive capacity is a crucial component within this discussion. Another crucial component is the optimization of innovation, which Dubina et al suggest is the “reasonable containment of creative and innovative activities in some spheres and their stimulation in other spheres” (p. 17). For example, diversification of investments into a broader spectrum of innovation spheres, not just for those technologies or technology fields that are given a high significance.

Table 4. Creativity, knowledge & innovation (Dubina, Carayannis, & Campbell, 2012)

| Area | Creativity | Knowledge | Innovation | Characteristic |
|------|------------|-----------|------------|--|
| 1 | No | Yes | No | Accumulated and partly copyrighted knowledge which may be involved into economic relations but not applied yet |
| 2 | Yes | No | No | Creative products in some of the cultural industries |
| 3 | Yes | Yes | Yes | “Creative knowledge innovation” (innovation-based on both knowledge and creativity) |
| 4 | Yes | Yes | No | “Creative knowledge”, producing new and potentially useful and applicable knowledge, but not applied yet |
| 5 | No | Yes | Yes | Knowledge-based innovation (application of existing and/or purchased knowledge) |
| 6 | Yes | No | Yes | “Pure creativity”-based innovation, taking place with no (almost no) references to knowledge |
| 7 | No | No | No | Routine economic or production procedures |

Consequently, this could mean that the less advanced an economy or society is, then the less knowledge, innovation, or creativity society and economy can benefit from (Figure 10). With this said, Dubina et. al (2012) also emphasize that the maturity of economic and non-economic markets is the significant here. Saturation of technology cycles highlight that not only innovation counts, but creative knowledge-based innovations, demanding creativity for the establishment of firsthand knowledge. “Understanding the “creativity economy” implies understanding the co-evolutionary effects of the structures and processes of the economy and society in interaction with knowledge, innovation, and creativity” (p. 18).

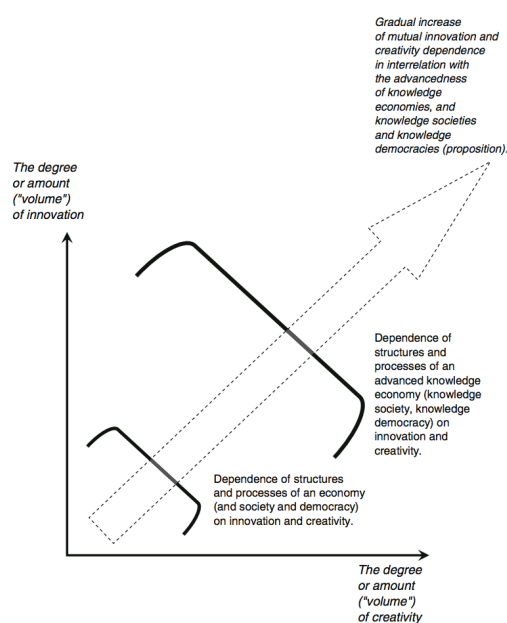


Figure 10. The increasing cross-interrelation of innovation and creativity (Carayannis & Campbell, 2011)

Reasons for Synergy

Another reason for why SIDS governments should aim for synergy is the fact that the creative industry “can be appreciated as a desirable feature of vitality in a knowledge society” as they are “cool and sophisticated” as well as profitable (Jeffcut, 2004, p.68). Similarly, Veselá & Klimová (2014) argue that creative industry in mutual synergy with a knowledge-based economy creates conditions for a strong and sustainable creative economy. It is necessary to remove barriers in science and research, to ensure appropriate protection of intellectual property and to lead towards creativity” (p.413). Also, Stam, de Jong, & Marlet (2008) find that “creativity may also be particularly useful in knowledge-based economies, where creativity is required to convert scientific and technological knowledge into market value” (p. 119). The synergy between these economies represents their mutual dependency on each other for sustainable socio-economic development.

In any case, “the process of creativity is sustained by inspiration and informed by talent, vitality and commitment, making creative work volatile, dynamic and risk-taking, shaped by important tacit skills (or expertise) that are frequently submerged (even mystified) within domains of endeavor (Jeffcutt, 2004, p.69). Despite their present-day impact and value, the crucial dynamics that form and transform the creative process in knowledge economies remain poorly comprehended. In a knowledge economy, these creative processes should be understood and the crucial organizational properties of these creative processes can be compromised as follows; (1) they are located in numerous communities and spaces, both local and global; (2) they are networked through dense transactions and knowledge relationships which articulate both traded and untraded interdependencies; (3) they are temporal, in that an infinite variety of highly differentiated symbolic goods juxtapose for attention in an interplay between producer and consumer through originality, identity and market opportunity. Thus, having a complete understanding of the creative economy is crucial to understanding the contemporary knowledge economy. However, as Jeffcutt stated, “there is a lack of strategic knowledge about the relationships and networks that enable and sustain the creative process in knowledge economies. Recent work on these problems emphasizes the significance of particular types of knowledge relationships in particular situations” (p.70).

Interestingly, Carafa’s (2008) main conclusion is that “the creative sector could play an important role within the knowledge-economy but this depends on the adaptation to the “big three” (digitization, convergence and globalization) fostered by the state itself” (p. 2). In his perspective, “the knowledge economy is featured by the emergence of an innovation-based production system, in which knowledge and creativity have taken a central role” (p.7). However,

in the Caribbean, according to Alexander & Butcher (2011) from the Economic Commission for Latin America and the Caribbean (ECLAC) one of the challenges rely on capacity building of the islands. In their perspective, the knowledge economy “requires a fundamental shift to a more innovation and entrepreneurship oriented posture. This is necessary if the region is to develop value through the exploitation of information and knowledge. The education system has a key role to play in this, moving away from its focus on examination and certification to one of equipping students with knowledge and skills; and the confidence and attitude to use them to deliver value to their societies and themselves” (p. 14). However, they do admit that the Caribbean is best placed in terms of access to information and knowledge, which means that the islands should put more effort into finding strategic ways of merging these two economies together. The biggest challenge for the Caribbean is not that the islands lack capacity, because that can be remedied with proper policy measures, but that policymakers are unsure of how to contextualize best practices from developed countries into the local innovations. With this, Goele (2009) states that for Curaçao (an independent country within the Dutch Kingdom similar to Aruba), the “main reason that it has not developed into a Creative Economy is because there is no shared vision of how this should be achieved. The government needs to understand the importance of the creative class and implement policies to support its functions, by focusing on institutional arrangements and on people, ideas and technology and not weaken the vital factors” (p. 63). This all illustrates why inclusive frameworks where all stakeholders are involved are crucial for small island states, because the capacity of success depend on it.

Moving forward, creativity should be addressed as a process, which requires knowledge, networks and technologies that can enables future generations to innovate and translate new novel ideas into innovative goods and services. While this is crucial, it is still not fully understood by policymakers. In the end, Veselá & Klimová (2014) conclude that “the creative economy, in synergy with a knowledge-based economy, is able to transform towns and regions into economically more active and attractive places for life. We strongly believe that educational institutions should become key partners of local and regional governments in the development and maintenance of creative potential in towns and regions” (p.417). It is clear that there remains a demand to undertake situated analyses and examine how 'creativity' is constructed in particular settings and segments of the contemporary knowledge economy, and specifically what this process could look like for developing countries and small island states in the Caribbean.

4. Catalyzing Innovation in Small Island Nations

Small island states are continuously changing and are aiming to mitigate challenges they face within a globalized world. With limited resources and a growing population, island states remain vulnerable in adhering to adequate policy measures for more sustainable development. Aruba defines innovation as “building new and/or enhancing existing products and services instead of importing and/or developing solutions for societal/global challenges using new processes and collaboration models that lead to resilience” (Government of Aruba, 2018). More specifically, “sustainable future development presupposes adequate and timely responses to issues such as urbanization, mobility, environmental decay, water management, food production, energy resources, globalization and technology” (Kourtit et. al, 2011, p.146). According to von Gesseneck et. al (2018) remote island territories, such as Aruba, “face systemic challenges, such as geographical isolation, high transport costs, heavy dependency on imports, the impact of climate change and difficulties with energy supply. There is indeed wide spectrum of systemic challenges” (p. 107). Some of these challenges include: relatively low levels of education, brain-drain, scarce public and private R&D investment, lack of coordination between education, science, research, innovation, economy, and society. For some time now, governments and investors have been considering benefits of island spatiality to promote urban sustainability and innovation, by building so-called smart cities, eco-cities, and sustainable cities (‘smart eco-cities’) (Grydehøj & Kelman, 2016). Aruba has made great attempts in shifting its focus on more sustainable, renewable, and innovative approaches to socio-economic development, but have been limited in this journey due to factors such as financial, social and human capital. “Globalization and global competitive trends are leading to the greater concentration of resources associated with the modern economy (high-tech industries, flexible IT-skilled labor pools, research and development institutes, ICT-specializing universities) in large urban centers and metropolitan areas. This trend suggests that new technologies are not altering a pattern of concentration ushered in by industrialization; but are helping to fuel it” (Baldacchino, 2006, p. 91). Now more than ever, the acceleration of innovation within small island states has become a crucial component for successful sustainable socio-economic development of societies.

4.1 The Small Island Developing State

The concept of Small Island Developing States (SIDS) was formalized in June 1992 at the United Nations Conference on Environment and Development. Later on in 1994, the Barbados Program of Action was founded to assist these SIDS in their attempts towards sustainable

development. Formally, international representation is done by the United Nations Office of the High Representative for the Least Developed Countries and Small Island Developing States (UN-OHRLLS), which consists of 38 UN members and 14 non-UN members or Associate Members of Regional Commissions. According to UN-OHRLLS (2013) SIDS is defined as a “distinct group of developing countries facing specific social, economic and environmental vulnerabilities” (p. 2). Between the Caribbean region, the Pacific and the Atlantic region, Indian Ocean, and Mediterranean and South China Sea (AIMS), there are a total of 52 countries and territories that are currently identified as SIDS by the UN-OHRLLS. Aruba, in this case is an Associate Member of the Regional Commissions, since it is not an independent country, but remains part of the Kingdom of the Netherlands.

| Caribbean | | | |
|---------------------------------|------------------------|---|-----------------------------------|
| Anguilla | British Virgin Islands | Guyana* | Saint Kitts and Nevis* |
| Antigua and Barbuda* | Cayman Islands | Haiti* | Saint Lucia* |
| Aruba | Cuba* | Jamaica* | Saint Vincent and the Grenadines* |
| Bahamas* | Curacao | Martinique | Suriname* |
| Barbados* | Dominica* | Montserrat | Trinidad and Tobago |
| Belize* | Dominican Republic* | Netherlands Antilles | Turks and Caicos Islands |
| Bermuda | Grenada* | Puerto Rico | United States Virgin Islands |
| | Guadeloupe | | |
| Pacific | | | |
| American Samoa | Kiribati* | Northern Mariana Islands, Commonwealth of the (USA) | Timor-Leste* |
| Cook Islands | Marshall Islands* | Palau* | Tonga* |
| Federated States of Micronesia* | Nauru* | Papua New Guinea* | Tuvalu* |
| Fiji* | New Caledonia | Samoa* | Vanuatu* |
| French Polynesia | Niue | Solomon Islands* | |
| Guam | | | |
| AIMS | | | |
| Bahrain* | Guinea-Bissau* | Mauritius* | Seychelles* |
| Cabo Verde* | Maldives* | São Tomé and Príncipe* | Singapore* |
| Comoros* | | | |

Note: *UN Members, others are non-UN Members or Associate Members of Regional Commissions

Figure 11. List of SIDS by geographical order (World Health Organization, 2017)

According to Ikhlef (2014) “despite some cultural specificities, SIDS share the same concerns and develop strategies in face of similar threats related to their isolation, vulnerability, size and natural elements. The rapid development currently taking place on small islands may eventually have certain adverse effects on the human, cultural and natural environment, which are interdependent” (p. 17). In a broader scope, in the eyes of UN-OHRLLS (2013) these shared challenges faced by SIDS include: (1) tapered resource base robbing them of the benefits of economies of scale, (2) small domestic markets and high dependence on limited external and isolated markets, (3) excessive costs for energy, infrastructure, transportation, communication and service, (4) long distances between export markets and import resources, (5) low and

irregular international traffic volumes, (6) slight resilience to natural disasters, (7) increasing populations; high volatility of economic growth, (8) restricted opportunities for the private sector and a consistently large reliance of their economies on their public sector, and finally, (9) unstable natural environments.

Caribbean Region

Alongside the efforts by ECLAC, UNDP and other UN agencies in the Caribbean, Aruba and other European island states also reside under the Association of the Overseas Countries and Territories (OCTs) of the European Union (OCTA). Research and policy priorities of OCTA include: environment and climate change; trade and regional integration; research, education and innovation; financial services; and renewable energies.

Within the Caribbean region ECLAC is the main UN representative body. Caribbean countries have been classified as middle- to high-income countries by the World Bank, but according to ECLAC (2018), the Caribbean “has failed to keep pace with other developing countries, including SIDS, in growth performance” (p. 23). This insinuates that even though size and size-related limitations are important to consider, Caribbean countries must continue building resilience and strengthen capacities through policy, strategies, and actions. The economy of Caribbean countries will most likely remain in the middle-income trap, where it has been for several years, unless it becomes more competitive through innovation. This competitiveness enhancement requires lowering costs and increased productivity in all sectoral markets, which can only be realized by focusing on: “(1) skills development, (2) sustainable energy, (3) infrastructure, both physical and digital, and (4) private sector development, in order to develop new export activities and improve access to financing” (p. 35). Within the Caribbean numerous reports from UNDP, UNCTAD and ECLAC confirm that the creative industry is a valuable economy, which has potential for success in small island states. The creative industries “offer the Caribbean a strategic complement to the traditional sectors of tourism and mineral extraction, which is especially important in light of the fact that they often rely on the skills of young individuals of both sexes and can generate high levels of value-added” (p. 47). On the other hand, according to ECLAC, sustainable development should not only be targeting SDG 15 (life on land), but, and especially for the Caribbean, it should be targeting SDG 14 (life below water) considering their proximity to and dependency on the marine surroundings. This way, a knowledge economy could serve as a benchmark, because “while the Caribbean ocean holds the promise of improved livelihoods in both traditional and new areas, and has the potential to contribute substantially to achieving the SDGs and targets in key areas such as food security,

disaster risk reduction and sustainable energy, the foregoing threats must be contained or eliminated if this potential is to be realized. An important impediment to conserving marine resources and promoting the health of the ocean is fragmented ocean governance” (p. 45).

Looking at the EU OCTs, innovative developments have been taking place but at a more moderate pace compared to other developing countries. A research study by von Gesseneck et al (2018) investigated the main innovation systemic drawbacks that could weaken innovation ecosystems. Out of the 22 OCT members six were chosen, one of them, Aruba. Figure 12 illustrates that Aruba: (1) has no or insufficient investment in R&D; (2) is dependent on foreign knowledge in STEM; (3) experiences brain drain; (4) experiences a lack in innovation dynamics in the economy and in the public sector; (5) has weak levels of entrepreneurship and new entrants in the economy; (6) has weak co-operations between innovation organizations; (7) has an inadequate IPR system; (8) experiences a lack of innovation friendly economic regulations; (9) has a high level of uncertainty. It is also noticeable that these drawbacks are for the most part shared between the six OCTs, reinforcing the need for more collaborations between OCTs and Europe to provide better institutional infrastructures for innovation to take place.

| Systemic innovation areas | Systemic weaknesses | Policy instruments | New Caledonia | Saint Pierre and Miquelon | Saint Helena | Saint-Barthélemy | Aruba | Bonaire |
|---|---|---|---------------|---------------------------|--------------|------------------|-------|---------|
| Knowledge creation and R&D | No or insufficient private investment in R&D | Direct business R&D support | • | • | | | • | |
| | | Fiscal incentives | • | • | | | • | |
| Education, training and skills | Insufficient skills and competences due to low levels of education Dependence on foreign knowledge in science, technology, engineering and mathematics (STEM) Brain drain | Public-private partnerships | • | • | • | • | • | • |
| | | Innovation related skills education including vocational training | | • | • | • | | |
| | | Support to STEM education programs | • | • | | | • | • |
| Formation of new product markets and quality requirements (demand-side) | Lack of innovation dynamics in the economy and in the public sector | Migration policies including reverse brain drain instruments | • | • | | | • | • |
| | | Public procurement | • | • | • | • | • | • |
| Entrepreneurship | Weak levels of entrepreneurship and new entrants in the economy | Promoting entrepreneurial culture | | | • | • | | • |
| | | Support to start-ups | • | • | • | • | • | • |
| | | Dissemination of best practices of innovation management | • | • | • | • | • | • |
| Innovation networks | Weak co-operation between innovating organizations | Developing network relations | • | • | | | • | • |
| Regulatory frameworks | Inadequate IPR regime Lack of innovation friendly economic regulations High level of uncertainty | Financing network activities | • | • | | | • | • |
| | | IPR measures | • | • | | | • | • |
| | | Competition enhancing regulations | • | • | | | • | • |
| | | Implementing technical standards | • | • | • | • | • | • |

Source: cf. Borrás and Edquist (2016)

Figure 12. Main OCT systemic weaknesses and relevant innovation policy instruments (von Gesseneck, Toffanin, & von Gesseneck, 2018)

4.2 Sustainable Socio-economic Development in Small Islands

Conventionally, economic development has been measured in the perspective of Hildalgo and Hausmann (2008) “through a host of aggregated variables, mainly gross domestic product (GDP), adjusted by power purchasing parity. Yet, as a concept, development has always been associated with an increase in diversity that cannot be captured by such averages. As the human body develops, cells differentiate into neurons, muscles, bones, and other cell types. Similarly, as nations develop, different industries and products are born” (p. 6). Cities are engines of economic growth and offer opportunities for innovation and sustainable development. According to the World Bank (2017) “economic growth drives development by providing more resources for better education; improved health; expanded transport, water, and become more productive. Achieving persistently high growth is not easy, and few of the Least Developed Countries consistently reach 7 percent average annual GDP growth” (p.45). Larson (2000) defined sustainability as the “innovative and potentially transformative corporate activities that generate new products and processes that challenge existing practice” (p.305). Therefore, sustainability is a multi-dimensional problem. It implies responsible behavior towards future generations, even though they have no vote and cannot put direct pressures on policy-makers (Streeten, 1998). Many countries are developing in unsustainable ways, thus achieving economic growth at the expense of existing resources, shifting the burden of environmental degradation and damage to the health and well-being of a future citizenry. Economic growth, for the most time is directed at job creation, and, for Caribbean countries this effect is crucial, specifically to reduce youth unemployment. According to the World Bank (2017) jobs for young people are essential for the following reasons: “they are an important vehicle for the social, economic, and political inclusion of groups and individuals, and a lack of jobs can lead to discontent and unrest among disaffected young people” (p.44). Additionally, trade is paramount to sustaining development and improving economic growth, and inclusive trade facilitation is a powerful tool to foster global competitiveness. Aruba’s strategic positioning according to the Government of Aruba (2018) includes: (1) having rich cultural assets, (2) having a small and connected community, (3) having natural beauty, (4) geographic location, (5) strong tourism sector, (6) stable environment, and (7) welcoming people. Ultimately, Aruba aims to become a living lab for innovative island solutions for the Caribbean region.

Entrepreneurship

The relationship between entrepreneurship innovation and sustainable development has been addressed by various streams of thought and literature such as ecopreneurship, social

entrepreneurship, sustainable entrepreneurship and, indirectly, institutional entrepreneurship (Schaltegger & Wagner, 2011, p.223). The Government of Aruba has indicated that their vision is to foster an entrepreneurial mindset and improve business climate for startups and SMEs (Government of Aruba, 2018). Studies on the impact of technological innovation on growth have been predominantly based on the neo-classical tradition established by Solow (1956), where growth is driven by enhancements to capital and labor inputs, whether in terms of quantity or quality and productivity (Wong, Ho, & Autio, 2005). In this case, according to van den Berg (2016) “the rate of sustainable economic growth thus depends on whether humans can generate factor-augmenting technological changes to expand the effective stocks of all those factors of production that are fixed or limited in quantity” (p. 9).

The term ‘entrepreneur’ dates back to the 1700s, and has received periodic mentions in academic literature for two centuries, recognizing in particular entrepreneurs’ ability to control and organize productive processes under conditions of risk and uncertainty (Larson, 2000, p. 305-306). The primary work of Schumpeter (1911) established the “entrepreneur as innovator” concept as a significant figure in driving economic development (Wong, Ho, & Autio, 2005). Sustainable innovation is an emerging and fundamental force for change in business and civil society. Its potential to transform technology, products and markets distinguishes it as an area of entrepreneurial opportunity and a force of ‘creative destruction’ as defined by the father of modern entrepreneurship theory, economist Joseph Schumpeter (1934). According to van den Berg (2016), the entrepreneur “recognizes and grasps the opportunities for introducing a new product, changing a firm's management organization, exploiting a new market, finding a new source of raw materials, cutting the costs of production, or motivating the labor force” (p.5). Besides having effective institutions in a country, successfullness is tied to: (1) the society's attitude toward business success, (2) the prestige of business activity, (3) how well the education system prepares potential entrepreneurs, and (4) how much freedom entrepreneurs have to pursue their ambitions. Furthermore, van den Berg (2016) explored other endogenous technological change model based on Schumpeter's ideas, in this case the endogenous growth model is by Paul Romer (1990). The following five ideas determine the process in which individuals, firms, organizations, universities, or governments employ scarce resources to produce new knowledge, ideas, methods, forms of economic organization, and other changes in the way humans do things: “(1) Innovations are generated by intentionally employing costly (scarce) resources to create new products, ideas, methods, etc.; (2) Entrepreneurs seeking to innovate must compete with producers for the use of the economy's scarce, and thus costly, resources; (3) Innovation creates new products and techniques that are better, cheaper, more

attractive, and more convenient than existing products and techniques, which permits the entrepreneurs earn a profit; (4) Innovators know that later innovations will eventually replace their innovations; (5) Innovators and their financiers weigh the marginal costs of innovation and the discounted expected gains from each marginal innovation in deciding how many factor inputs they will employ in research and development and other innovative activities” (p.11). Overall, it can be concluded that the Schumpeterian tradition has given rise to models that are focused on innovation as a source of economic growth.

Besides the work of Schumpeter, there are other understandings of entrepreneurship, especially when linked to sustainability. Larson (2000) emphasized that “entrepreneurship is about innovation, regardless of context, hence an entrepreneurial analysis can be applied to large and small firms as well as value chains engaged in sustainability” (p. 315-316). Also, Onetti et. al. (2010) defines entrepreneurship as “the process through which they explore and exploit global opportunities, leveraging both local and international relationships, regarding inward and outward business activities. Relationships give access to new knowledge and also enable young companies to focus on core activities where they have distinctive knowledge” (p.339). To be innovative means to provide organizational and technical improvements that can be sold successfully in the marketplace. In a market system, sustainable development requires sustainability innovation and entrepreneurs who can achieve environmental or social goals with superior products or processes that are successful in the marketplace of mainstream customers (Schaltegger & Wagner, 2011, p. 223).

In Figure 13, four variations of entrepreneurship are presented; ecopreneurship, social entrepreneurship, institutional entrepreneurship, and sustainable entrepreneurship. Considering the scope of the creative industries, it can be deduced that the social entrepreneurship is perfectly aligned with this sector. While, from a knowledge-based economy point of view and with the ideals of the Aruban Government, ecopreneurship seems to fit. Interestingly, an appropriate combination of these concepts is to focus on sustainable entrepreneurship which aims to solve environmental and societal problems through economic activities. Defining social entrepreneurship has proven to be no easier than defining entrepreneurship (Tapsell & Woods, 2010, p. 537). However, two themes have emerged over the past two decades: “(1) the underlying drive to create social value and (2) activity is characterized by innovation or the creation of something new rather than the replication of existing enterprises or processes” (p. 538). However, based on their research findings, Schaltegger & Wagner (2011) indicate that “having a higher degree of entrepreneurship or new business creation prevalence does not guarantee enhanced economic performance and faster rates of economic growth (p. 344). This

means that only a very small proportion of entrepreneurs truly engage in technological innovation, thus providing food for thought for policy makers in terms of targeting entrepreneurial motivation.

| | Ecopreneurship | Social entrepreneurship | Institutional entrepreneurship | Sustainable entrepreneurship |
|--------------------------------------|---|---|---|--|
| Core motivation | Contribute to solving environmental problem and create economic value | Contribute to solving societal problem and create value for society | Contribute to changing regulatory, societal and market institutions | Contribute to solving societal and environmental problems through the realization of a successful business |
| Main goal | Earn money by solving environmental problems | Achieve societal goal and secure funding to achieve this | Changing institutions as direct goal | Creating sustainable development through entrepreneurial corporate activities |
| Role of economic goals | Ends | Means | Means or ends | Means and ends |
| Role of non-market goals | Environmental issues as integrated core element | Societal goals as ends | Changing institutions as core element | Core element of integrated end to contribute to sustainable development |
| Organizational development challenge | From focus on environmental issues to integrating economic issues | From focus on societal issues to integrating economic issues | From changing institutions to integrating sustainability | From small contribution to large contribution to sustainable development |

Figure 13. Characterization of different kinds of sustainability oriented entrepreneurship (Schaltegger & Wagner, 2011)

Social Innovation

Social innovation is not a new notion, but it appears to be entering a new phase in which it is increasingly seen as offering solutions to more systemic and structural issues in addition to localised issues (Nicholls, Simon, & Gabriel, 2015). Harnessing innovation for sustainable and inclusive development requires changes in the direction of key economic and social processes which cannot take place without the strong involvement of civil society. That is why growing attention is being given to several new approaches to innovation, amongst others pro-poor, inclusive, below-the-radar, frugal, bottom-of-the-pyramid, grass-roots and social innovation and more (United Nations, 2018).

Borzaga & Bodini (2014) state that the augmented attentiveness “devoted to social innovation over the past few years seems to be indicative of a deeper shift in the way we think about the economy and society” (p. 419). Ultimately, the increase of social innovation reflects the failure of the market, populated only by profit-seeking firms and the state that can no longer meet the rising and increasingly diversified requirements of society. Most innovations in business and technology fail as do most social innovations. Innovation must involve failure to continue

development, and the appetite for failure is bound to be limited in very accountable organizations or where peoples' lives depend on reliability. Innovation is therefore easier where risks are contained; where there is evident failure and where users have choice. The idea that innovation is more relevant to the private than the public sector is inherently problematic because it underestimates the ability of the public sector to innovate and exaggerates the innovative capacity of the private sector (Sorensen & Torfing, 2011). "While the community-driven nature of social innovation limits the potential for scaling up and the role of policies, appropriate interventions may include grants and managerial and technical support to community initiatives, and financing for research" (United Nations, 2018, p. 88).

Table 5. Definitions Social Innovation

| Source | Definition |
|--|---|
| Nicholls, Simon, & Gabriel (2015) | Varying levels of deliberative novelty that bring about change and that aim to address suboptimal issues in the production, availability, and consumption of public goods defined as that which is broadly of societal benefit within a particular normative and culturally contingent context. |
| Grimm, Fox, Baines, & Albertson (2013) | Social innovation can refer to both the means and the ends of action. Thus, social innovation may refer to new products and services that address social needs, that is, products and services which help to build more sustainable, cohesive and inclusive societies. |
| Westley & Antadze (2010) | Social innovation is a complex process of introducing new products, processes or programs that profoundly change the basic routines, resource and authority flows, or beliefs of the social system in which the innovation occurs. Such successful social innovations have durability and broad impact. |
| Borzaga & Bodini (2014) | Social innovation can be any type of innovation that contributes to addressing social needs or problems |
| Dawson & Daniels (2010) | Social innovation refers to the process of collective idea generation, selection and implementation by people who participate collaboratively to meet social challenges. These ideas are owned by people who work together in pursuing social goals that may – but need not – service other organizational, technical, commercial or scientific goals |
| Kocziszky & Veresne Somosi (2016) | Significant differences between the social and economic innovation can be found primarily in the aims and capital needs of innovation. The aim of social innovation is to secure a better quality of life, which can be reached by increasing employment rates and by improving security and environmental conditions |
| Government of Aruba (2019) | Focus on the people's well-being, personal advancement and values to be instilled in the society |

The conceptual terms, such as "social enterprise," "social entrepreneurship," and "social finance" are often used interchangeably with "social innovation" (Westley & Antadze, 2010). However, there are some fundamental differences among them (Figure 14). A social enterprise might aim to respond to a social need in society, but as an enterprise this means that it is privately owned, and, therefore, profit oriented. A social enterprise, while having its own products and services on the market, combines business goals with social needs. On the other side, social entrepreneurship is a modification of the word entrepreneurship, and is a more

human-centered approach compared to an enterprise. Social innovation does not necessarily involve a commercial interest, though it does not preclude such interest. More definitively, social innovation is oriented towards making a change at the systemic level” (p. 3).

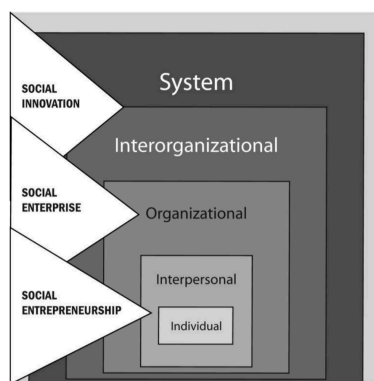


Figure 14. Systemic view of Social Innovation (Westley & Antadze, 2010)

Looking at Figure 14, the multi-lateral approach of these three concepts are interconnected, so while social entrepreneurship focuses on the individual within the society and social enterprise addresses organizations within the society, social innovation attempts to change the way a system operates within the society. It can therefore be argued that in the pursuit of innovation nationally, the focus should be on systemically addressing change. While many minor innovations are constantly introduced at all levels, it seems most imperative to consider those innovations that have the likelihood to interrupt and transform the wider system. In order to reach that, “a social innovation must cross multiple social boundaries to reach more people and different people, more organizations and different organizations, organizations nested across scales (from local to regional to national to global) and linked in social networks” (p. 4).

Furthermore, the study of social innovation processes has the potential to provide a comprehensive framework of how practices are created and institutionalized. According to Cajaiba-Santana (2014) innovative practices that develop from social innovation are “fundamentally constituted around institutional frameworks and actors that articulate within those frameworks embedded in broader social contexts. The use of institutional and structuration theories enable us to analyze it on different levels, which provides a more nuanced and situated approach to social innovation processes” (p. 47), as illustrated in Figure 4. Also, “the social innovation process requires attention to the individual persons; more specifically, to what they think, to what they value, to how they behave, and to how interrelations between actors and social systems take place” (p. 48). Now, interestingly this model shows that agents are both controlled and empowered by institutional structures in a society to be able to create social

systems. These agents are considered to be purposeful, knowledgeable, and reflexive. In this case, the notion of ‘reflexivity’ suggests that “actors have the capacity to monitor routinely their actions by reflecting upon them and acting according to their intentions. Reflexivity stands for the continuous monitoring of the social context and the activities taking place within this context” (p. 47).

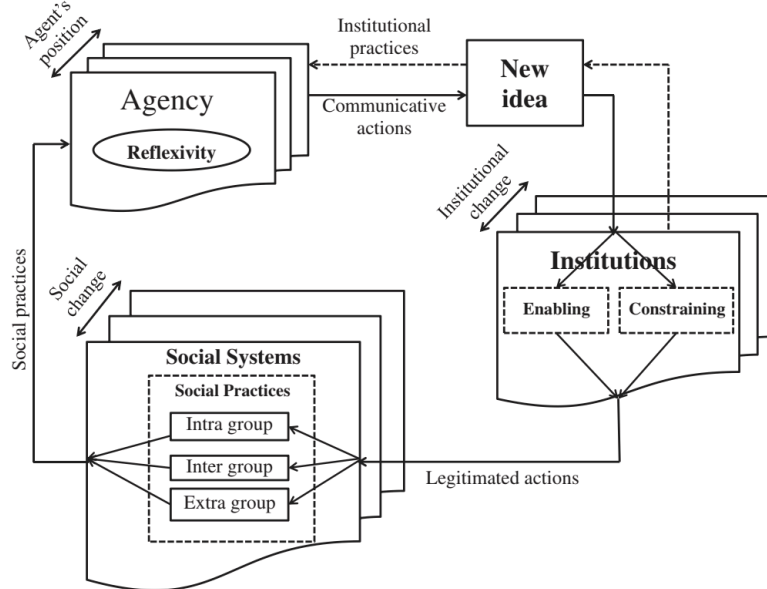


Figure 15. Schematic Conceptual Model of the Social Innovation Process (Cajaiba-Santana, 2014)

In the quest for identifying the different levels at which social innovations act, it is clear that previous works have failed to state clearly their level of analysis and where the social innovation analyzed occurs. Based on Figure 15, three different levels of social change can be identified, which are the intragroup, inter group, and the extra group. First, there are the intra social group innovations, which are related to the basic norms, values, rules, habits, and conventions of a given social group. The institutions that frame actions at this level are group related and demand a micro level analysis. Second, there is the meso level of inter group social innovations. At this level, we find diverse social groups linked in collaborative and/or competitive interactions. Lastly, the extra group level involves of a macro level of social systems. This level of analysis has received little attention in previous studies of social innovation, being more richly presented in the analysis of social movements and in public policy studies (Cajaiba-Santana, 2014).

With this theoretical background on social innovation, it is more evident how social innovation could merge through creative industries and knowledge economies, considering that creativity and knowledge can simply not be separated from each other. According to the Fontys

Academy for Creative Industries (2016) “creativity is advanced as a crucial factor for making social innovation happen, where creativity can be seen as the human ability to produce new things, or create new situations, rather than the innovative use of available resources and/or of known technologies” (p. 41)

Talent Development

In the eyes of Dirks, Gurdgiev and Keeling (2010) “economic value and competitive differentiation of cities will increasingly be derived from people and their skills, creativity and knowledge, as well as the capacity of the economy to create and absorb innovation. To compete in this new economic environment, cities will need to better apply advanced information technology, analytics and systems thinking to develop a more citizen-centric approach to services. By doing so, they can better attract, create, enable and retain their citizens’ skills, knowledge and creativity” (p. 1). Like most island states, the challenge of mitigating the concept of brain drain remains a challenge. According to Dawson L. R., (2007) lately, “the debate has moved beyond brain drain to speculate on the development prospects of brain circulation through return migration. Also on the current agenda are the prospects for economic development through remittances and the engagement of diaspora communities” (p. 1). Dodani & LaPorte (2005) simply defines brain drain as people that are searching for either an enhanced standard of living and quality of life, higher salaries, access to innovative technology, and more stable political conditions. On the other hand, Johnson (2009) defines brain drain as the momentous increase in the migration of highly skilled and higher educated Caribbean residents to more developed countries, causing in a scarcity of individuals remaining with the capacity to adequately develop the Caribbean countries. The developed (receiving) countries gain extra skills and resources from the migration as it continues to become wealthier, while developing (source) countries lose highly skilled human capital and unavoidably become poorer. Seemingly, this brain drain is caused by the reduction of opportunities in the developing countries next to the international labor market demands. Dawson (2007) continues by expressing that between the small, developing economies of the Caribbean, the discourse on development-migration has a comparable path. “At first the emigration of lower skilled workers was seen as a safety valve for unemployment and an important adjunct to national incomes. Acceptance turned to dismay, however, as increasing numbers of skilled workers moved abroad and brain drain was identified as a serious impediment to economic development at home” (p. 2). According to the World Bank (2017) a main weakness in the Caribbean is the limited number of tertiary educated individuals, the misalignment between the educational system and the labor market, and the high

level of migration of tertiary educated professionals. Also, Lozano-Ascencio & Gandini (2012) believes that such a waste of skills arises when individuals take jobs below their education level and found that the Latin America and Caribbean region documented the highest growth of skilled migration to OECD countries. In the perspective of the OECD (2004) “in many locations, knowledge institutions in fields such as art, design or architecture function as important nodes in creative clusters, attracting highly educated people and creative businesses. There is a need to increase skill levels and develop talent in the creative industries and tourism” (p. 25). Thus, the World Bank Group (2017) recommends that “sub region must align education and training with future requirements by addressing gaps in marine sciences, and in research, innovation and technology development that relates to the oceans. The Caribbean people, inhabiting small islands in a vast sea, must increasingly develop a seaward as much as a landward outlook” (p. 46). According to van den Berg H. (2016) human capital is possibly an “important contributor to the creation of new technology because, the creation of new ideas, knowledge, methods, and other forms of technology requires inputs of productive resources. It has often been suggested that innovative and R&D activities require highly knowledgeable and educated labor” (p. 20).

The aim of the Aruban Government is to steer talent cultivation and retention with a focus on the skills needed in a future work-force and develop a system to be able to rapidly adapt to changing skill requirements (Government of Aruba, 2018). According to Lee (2014), the conversation on the globalization of higher education emphasizes “revenue generation while neglecting other diverse rationales pursued by governments and institutions. For countries that are seeking to venture into a knowledge economy or accrue greater competitive advantages under globalization, many policymakers view cross-border higher education as a platform for developing human talent” (p. 807). In the perspective of Johnson (2009) there are “three main reasons people leave their home country are: to receive higher incomes, to capitalize on better career developmental opportunities and to gain a greater degree of freedom” (p. 11). Now to solve this dilemma would mean that governments need to work on improving conditions that will provide better incentives for the highly skilled laborers to stay. Johnson also emphasizes that “governments in source countries should encourage linkages and partner relationships between the diasporas and institutions in the source countries. These kinds of programs would help members of the diaspora become more socially and economically connected to their countries of origin and could possibly serves an incentive for them to return home” (p. 12). The Aruban Government has initiated the “District 297” program to attract professionals and to build a communication platform. However, the process of setting up such programs take time so

measurable returns are limited. Another way, perhaps a more extreme way, Johnson proposes Caribbean countries to reduce their brain drain by encouraging students to only pursue a degree abroad if it is not available in their home country or, more drastically, only providing study loans to students who are going to study a profession that is needed in the current economic scheme. In the Aruban case, this would mean that the government would only give out study loans (Aruba Lening) to students who want to pursue a study something related to the six proposed economies. It can go as far as contractually obliging them to return to the island and work for a certain amount of years to return on investment and further develop Aruba.

Now, when it comes to talent development in creative and knowledge industries such as in STEM studies, there are different things that can be implemented to further encourage the skill development of both the younger and older generations. According to Csermely, Korlevic and Sulyok (2007) several ways governments can encourage talent development amongst adolescents are to: (1) develop special secondary schools that are designated to STEM subjects and training, (2) develop apprenticeship/laboratory programs to encourage students to familiarize themselves with the working environment, (3) introduce national STEM competitions, and (4) introduce summerschool programs that could provide extra accessibility for students to learn and develop skills. In conclusion, Klimova and Vesela (2014) reiterate that the creative industry merged with a knowledge-based economy, is able to renovate cities into economically more appealing places for life. Educational institutions should remain key allies of local and regional governments in the development and upkeep of creative potential in communities.

5. Applying Innovation Models to Socio-Economic Development

Innovation has always been perceived as being linear, meaning that it has been for-profit inventions by researchers for large corporations, however, currently, it has evolved to a collaborative world between academia, government, private sector, and society. Innovation, therefore, can now be seen as a more systematic process with an accent on effective coordination of a system in which high skills are broadly distributed in diverse areas (Porlezza and Colapinto, 2012). The table below gives a clear overview of how the relationship between science and innovation has progressed from the initial linear model in 1945 to the latest Quadruple- and Quintuple Helix Models from 2009 and 2010. “Public science involves the complementary collaboration between public and private institutions and their associated individual actors that have the public good as a central focus” (Cunningham, Menter, and O’Kane, 2017, p. 143).

Table 6. Innovation Theoretical Models (Villarreal & Calvo, 2015)

| Author | Theoretical Model | Type of relation to innovation transfer |
|----------------------------------|-------------------------------|---|
| Bush (1945) | Linear Model | SPONTANEOUS: innovation is commercialized from the previous generation of knowledge. There is not any coordination through liaison agents. |
| Kline and Rosenberg (1986) | Chain-Linked Model | COMPLEX: there is feedback system based on links between research and innovation. It generated delay and misunderstanding about who takes the lead in the process of knowledge transfer. |
| Gibbons et. al (1994) | Mode 2 | ACTIVE: knowledge and production is generated from the interdisciplinary collaboration of researchers. There are not specific mechanisms for innovation transfer. |
| Rothwell (1994) | Integrated Model | PARTIAL: innovation is based on a process of accumulation of know-how between knowledge generators and operators. The innovation transfer needs the previous solution of problems of intellectual property management. |
| Callon (1994) | Techno-economic Network Model | PARTICIPATIVE: innovation is generated from the collaboration between Science and Technology (transfer pole), and Technology and Market (development pole). |
| Freeman (1987) | National Innovation System | RECEPTIVE: innovation occurs through the dynamic interaction among network of public and private institutions with different rules of engagement. Innovation developments are responsive to the needs of the agents. |
| Etzkowitz and Leydesdorff (1995) | Triple Helix Model | INCLUSIVE: university takes the lead in generation of transfer knowledge to society through reciprocal and continuing relationships with the industry. |
| Carayannis and Campbell (2006) | Mode 3 | SYSTEMIC: the knowledge production system architecture focusses on leverages higher order learning processes and dynamics that allows for both top-down university, industry and government polies and bottom up civil society priorities to interact and engage with each other. |

| | | |
|--------------------------------------|--|---|
| Chesbrough (2003) | Open Innovation | DYNAMIC: innovation is generated from experimentation and collaboration among firms, universities, government and final users. A model of interaction based on rules is determined for the transfer of value to all stakeholders. |
| Carayannis and Campbell (2009, 2010) | Quadruple Helix Model Quintuple Helix Model | ECOSYSTEMIC: the knowledge transfer includes relations with civil society (Quadruple Helix) and brings the perspective of the natural environment of society and the economy for knowledge production and innovation systems (Quintuple Helix). |

5.1 The Innovation System

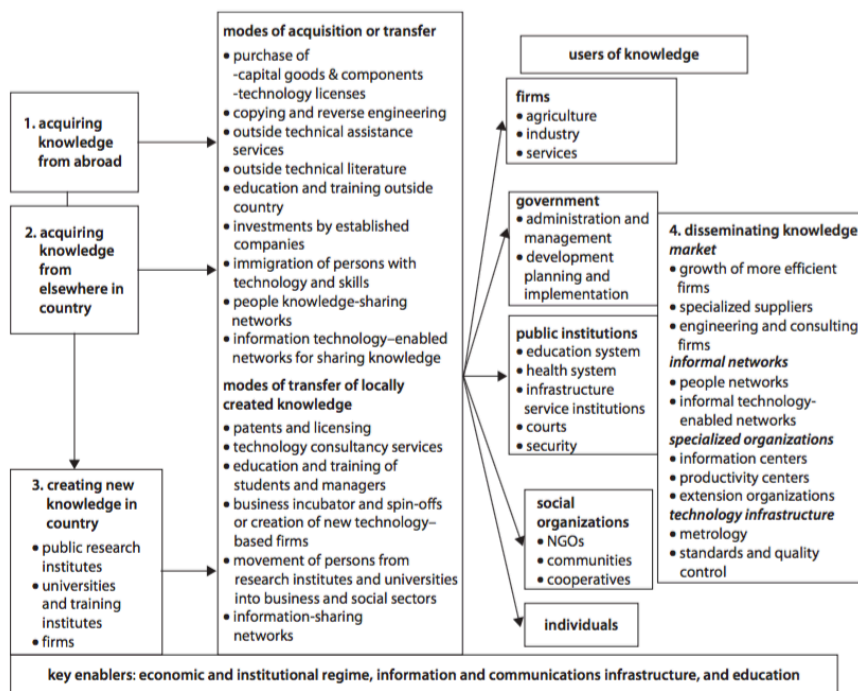
Innovation processes evolve and develop within what are called ‘innovation systems’ on national, regional and international levels. These are constructed out of private and public organizations and actors that relate in various ways and bring together the technical, commercial, and financial competencies and inputs required for innovation to prosper accordingly (World Bank, 2010). Government innovation policies should focus on intervening within such systems. The systemic nature of innovation processes notes that firms do not normally innovate in isolation but in collaboration and interdependence with other organizations. These organizations may be other firms (suppliers, customers, competitors, etc.) or non-firm entities such as universities, schools, and government ministries (Fagerberg, Mowery and Nelson, 2015). Edquist (2005) speaks of innovation as being “product innovations” and “process innovations”, where product innovation refers to advanced and improved commodities as well as “intangible services”, and process innovations are “new ways of producing goods and services” (p. 182). It is important to note that Edquist does not limit these innovations to technology and includes innovation in the organization as well. In this scenario, systems of innovations (SI) are the determinants of the innovation process, thus, all important economic, social, political, organizational, institutional, and other factors that influence the development, diffusion, and use of innovations. The three perspectives that are clustered variants of a single generic “systems of innovation” approach, which are national, sectoral and regional SIs. According to Edquist (2005) the expression “national system of innovation” (NSI) was, in published form, first used in Freeman (1987) (Table 6). He defined it as “the network of institutions in the public and private sectors whose activities and interactions initiate, import, and diffuse new technologies”, and is used specifically for country-context SIs (p. 183). The main components in SIs are organizations, among which firms are often considered to be the most important ones, and institutions. However, the specific set-ups of organizations and institutions vary among systems, which means that each country can construct their own SI relative of the relevant organizations and institutions present.

Generally, the main function or the overall function in SIs is to pursue innovation processes, i.e. to develop, diffuse and use innovations. According to Edquist (2005) the

following activities can be expected to be important in most SIs: “(1) Provision of R&D, (2) Competence building in the labor force to be used in innovation and R&D activities, (3) Formation of new product markets, (4) Articulation of quality requirements emanating from the demand side, (5) Creating and changing organizations needed for the development of new fields of innovation, (6) Networking through markets and other mechanisms, including interactive learning between different organizations (potentially) involved in the innovation processes, (7) Creating and changing institutions that influence innovating organizations and innovation processes by providing incentives or obstacles to innovation, (8) Incubating activities, (9) Financing of innovation processes and other activities that can facilitate commercialization of knowledge and its adoption, and (10) Provision of consultancy services of relevance for innovation processes” (p. 190-191).

Considering that competence building is an important activity in SIs and given that R&D has earlier been a central activity in SI studies, it can be concluded that the SI approach focuses on three types of learning: (1) innovation by firms, (2) R&D by universities and public research institutions, (3) competence building through education in schools, universities and even firms in order to increase human capital. “In most NSIs, especially in low- and medium-income nations, only modest sums are invested in R&D and most of the R&D is performed by public organizations. The few countries that invest heavily in R&D are all rich, and much of their R&D is carried out by private organizations” (p. 193). Because of this, “one implication of the complex interface between research and innovation is that links between universities/public research organizations and innovating firms are especially important to the performance of NSIs” (p. 194). Furthermore, there are three ways in which we can identify boundaries of SIs: (1) spatially / geographically, (2) sectoral, and (3) in terms of activities.

Used in this way, the SI approach can be useful for the creation of theories about relations between specific variables within the approach. According to the United Nations (2018) matured SI encourage “local, national and international collaborations that cut across disciplines. Building collaboration capabilities between national actors is fundamental to strengthening a country’s endogenous potential over the long term. Collaborations along supply and value chains, including demand responsiveness and social acceptance as well as the commercial viability of innovation. For developing countries with an underdeveloped local knowledge base and limited access to market intelligence, developing one of the key steps. However, such links will only be operative if some local capacity has been built previously through investment in education and training” (p. 54).



Source: Author (Carl Dahlman).
 Note: NGOs = nongovernmental organizations.

Figure 16. Innovation System in a Developing Country (World Bank, 2010)

Specific features of SIs in developing countries are illustrated in Figure 16 according to the World Bank (2010). The first column shows that innovation may be home-grown or imported and that it could be developed locally in either “public or private R&D labs and firms” as well (p. 59). The second column shows that the “innovation may be transferred in various ways, ranging from investment or formal purchases of technology, capital goods, components, or products to movement of people and informal sharing of information by people or through information-enabled networks”. The third column shows that this “may be transferred to users: firms, government, public institutions, social organizations, or individuals”. Lastly, the fourth column shows that “dissemination occurs through market mechanisms such as the growth of more efficient firms, as well as through informal networks and special institutions or programs such as technological information centers and productivity and extension agencies” (p. 59).

The Strengths and Weaknesses of the SI Approach

The diffusion of the SI approach has been surprisingly rapid and is now widely used in academic circles. The approach also finds broad applications in policy contexts by regional authorities and national governments, as well as by international organizations such as the OECD, EU, UNCTAD and UNIDO (Edquist, 2005, p. 184). There are six elements that are often considered to be strengths of the SI approach by academic analysts, policy makers, and increasingly by firm

strategists, and partly explain its rapid diffusion. The SI approach; (1) places innovation at the center, emphasizing that innovation is a matter of producing new knowledge or combining any type of existing knowledge in a new way, (2) is a holistic, inclusive and interdisciplinary perspective, (3) is an evolutionary perspective; thus, an optimal or ideal SI cannot be specified, (4) emphasizes interdependence and non-linearity. Institutions and agents do not innovate in isolation; thus, collaboration and interaction are inevitable, (5) encompasses both product and process innovations, as well as subcategories of these types of innovation, (6) emphasizes the role of institutions. However, the SI approach also has weaknesses, which represent challenges for countries that still need to develop their SI and identifies key elements for future research on systems of innovation. One specific weakness is the presence of conceptual diffuseness and the lack of specification of the boundaries of the system. Because of this, the SI and other variants of it should be considered an approach or conceptual framework and not a theory.

5.2 The Helix Innovation Model

The triple helix model of innovation refers to a set of interactions between academia, industry and governments, to foster economic and social development. This framework was first hypothesized by Henry Etzkowitz and Loet Leydesdorff in the 1990s, with the publication of the “The Triple Helix, University-Industry-Government Relations: A Laboratory for Knowledge-based Economic Development” report (Etzkowitz and Leydesdorff, 1995). The approach of the national innovation system by Lundvall and Freeman represents progress of the innovation process, which no longer only depends on the activity produced within firms, but requires the interaction of agents from the environment, knowledge generators and innovation-incentivizing policies. This approach is particularly relevant in the stimulation of collaboration between universities, industries, and governments, thus inspiring the introduction of the Innovation Helix models (Triple Helix). Interactions between universities, industries, and governments have given rise to new intermediary institutions, such as technology transfer offices, research centers, and science parks. Remarkably, according to Afonso, Monteiro, and Thompson, (2010) “economies where triple helix applies have high levels of skilled labor, knowledge-based and innovation-driven industry and service sectors, technology-intensive universities, governments and industries” (p. 5).

However, considering the evolution of national innovation systems, and the existing conflict over which path should be taken in the collaboration between universities and the industry, Etzkowitz and Leydesdorff (2000) acknowledge the diversified institutional arrangements of government, university and industry relations. Three different situations are

presented: (1) a model where the government overpowers the university, industry and government relations (seen in the Soviet Union); (2) a model which consists of separate institutional helix spheres with strong borders dividing them (seen in Sweden); and (3) a model where the helix spheres overlap with each other while taking the role of the other through hybrid organizations emerging at the interfaces. According to the authors, out of the three models, the first model is considered the failed developmental model, due to the limited room for “bottom up” initiatives, where innovation was discouraged rather than encouraged. Considering the Aruban context, Model 2 is not effective either, because effective horizontal collaboration between helices is nonexistent. The notion, especially from the government side is that the Aruban helix spheres are working cooperatively, however if this was indeed the case, the linkages between the government, university and industry would have been stronger by now. In the end, Etzkowitz and Leydesdorff (2000) express that “in one form or another, most countries are presently trying to attain some form of Triple Helix model 3. The common objective is to realize an innovative environment consisting of university spin-off firms, tri-lateral initiatives for knowledge-based economic development, and strategic alliances among firms large and small, operating in different areas, and with different levels of technology, government laboratories, and academic research groups” (p. 112).

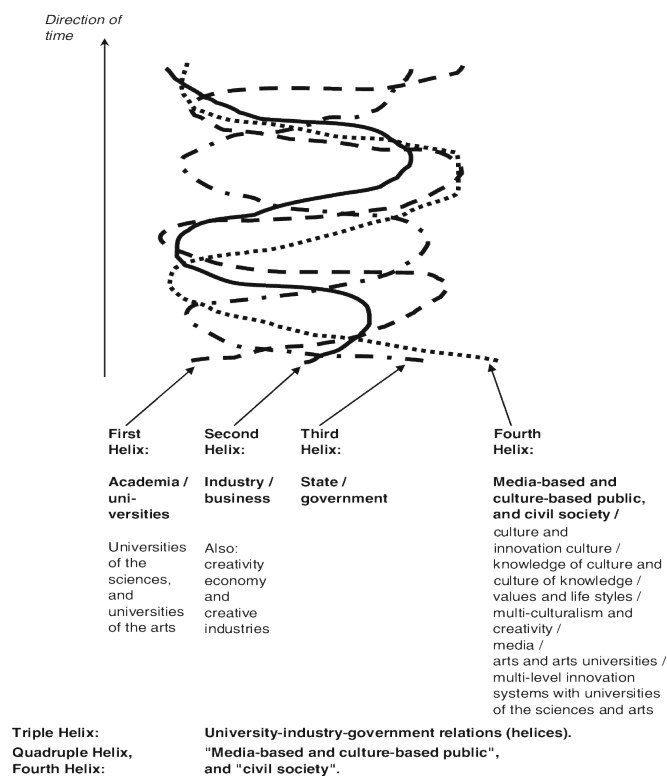


Figure 17. The Conceptualization of the Quadruple Helix Model (Carayannis & Campbell, 2011)

Extending to the Quadruple Helix Model

It is becoming more prominent that knowledge and innovation policies and strategies must start acknowledging the crucial role of the public for the successful achievement of goals and objectives aligned by either the government or even the Sustainable Development Goals of the UN. The Quadruple Helix Innovation Model (QHIM) is not yet widely used as a concept in innovation research. In academic literature, there are many approaches that can be classified as Quadruple Helix Innovation Model concepts, the aforementioned Triple Helix Innovation Model is one example. What can be concluded is that in all of these concepts, a fourth group of innovation actors have been added into the Triple Helix model. There are different views of what the fourth helix consist of, so it can range from intermediate innovation organizations to different users/consumers as well (Füzi, 2013). The Quadruple Innovation Helix Model connects social ecology with knowledge production (Mode 3) and innovation. Afonso, Monteiro and Thompson, (2010) argue that the Triple Helix Model is not sufficient for long-term innovative growth, so the Quadruple Helix Model “adds a fourth helix, civil society, which takes part in the knowledge creation process” (p. 5). However, according to Carayannis and Grigoroudis, (2016), “the most important constituent element of the quadruple helix, apart from an active civil society (the forth helix), is the resource of knowledge, which circulates between social sub-systems and hence affects innovation and know-how in a society” (p. 37) (see Figure 17). The Quadruple Helix Model, in this sense, means to “add the “media-based and culture-based public” sphere in the helix innovation model. This fourth helix associates with ‘media’, ‘creative industries’, ‘culture’, ‘values’, ‘life styles’, ‘art’, and perhaps also the notion of the ‘creative class’, a term, coined by Florida in 2004” (Carayannis & Campbell, 2009, p. 206), which could serve as a fitting framework for the synergy between the creative industry and the knowledge economy. The QHIM, therefore, visualizes the cooperative interaction and exchange of knowledge through the following four sub-systems (helices):

- Education System — refers to academia, universities, higher education systems, vocational schools and primary education (human capital)
- Economic System — consists of industry, firms, services, and banks (economic capital)
- Political System — indicates the direction in which the country is heading in the present and future, specifically in the legislative and policy making spheres (political and legal capital)

- Civil Society — media based-culture integrates and combines two forms of capital: culture-based public; tradition, values etc. (social capital) and media-based public; television, internet, newspapers (capital of information).

While in the Triple Helix Innovation Model, the university is the innovative leader, in the QHIM innovation empowers the users and encourages the development of innovation that are pertinent for users (civil society). In this case, the user or citizen owns and drives the innovation processes in a society. The likelihood for the explanatory potential of such a fourth helix is that culture and values influence every national innovation system. Having a proper innovation culture is crucial for promoting a progressive knowledge-based economy and creative industry. Also, having a society driven helix is vital for assigning top-priority factors to innovation and knowledge in a country (e.g. research, technology, education) (Carayannis & Campbell, 2009). The lack of involvement of civil society in the eyes of the Värmland County Administrative Board (2018) might lead to (1) products and services not used, (2) lack of transparency, (3) innovators and end-users do not understand each other, (4) frustration, (5) technical innovation instead of social innovation. “Using the Quadruple Helix and involving the citizens in the development of an innovation can lead to more successful, user oriented innovations. The end users will be more likely to accept and use the innovation. It will also have a greater social benefit at a lower cost and improve empowerment of the citizens, who will increasingly experience trust towards the innovators and become an active part of the innovation system” (p. 4). Interestingly, a good example of how cultural norms and values influence the innovation helix model, is that in most countries Science, Technology, Engineering and Math (STEM) fields in universities are not gender-symmetric, because of male dominance. Thus, stimulating women to be more interested in enrolling in STEM studies would also imply shifting the ‘social images’ of technology in a given society. Similarly, Deakin, Mora and Reid (2018) believe that the QHIM “sees the role of these institutions not as the agents of any intellectual capital, or organized knowledge production, but instead as the media of a creative sector whose democratization of wealth creation allows the public to participate in the governance of science and technology as members of civil society” (p. 96). Additionally, according to Bonaccorsi, Catalano, Daraio and Moed, (2016) “issues such as sustainability, climate change, urban congestion, mobility, or patterns of energy consumption have been addressed with a mix between research, Information Technology, and participatory approaches to social change. Citizens are much more and better informed than before, due to the data revolution, and share their experiences in digital communities. They increasingly ask to be involved in decisions. Innovation becomes a joint product between research, digitalization, and social creativity” (p.7). Thus, societal participation

remains a prominent component in accelerated innovative growth in countries. Furthermore, the creators of the helix innovation model, propose two possible interactions between the helices, which can either be centralized or decentralized. In a centralized approach, the government controls both the university and industry, whereas in a decentralized approach, each of the helices develops and co-exists independently. Interaction and cooperation between these four helices foster the co-evolution of the government, university, industry, and society. Overall, the QHIM provides, then, a useful framework of orientation for policymaking, implementation and analysis (Etzkowitz & Leydesdorff, 2000).

Now, Arnkil, Järvensivu, Koski et. al (2010) developed 4 different models of the QHIM, which are the (1) Triple Helix + Model, the (2) Firm-centered Living Lab, the (3) Public sector-centred Living Lab, and the (4) Citizen-centered Living Lab. In the first model, the main goal of the innovation activity is to produce commercially successful high tech products and goods. The type of innovation includes high tech innovations and radical innovations. The initiators of the innovation process remain between the firms, universities and governments. According to Arnkil et. al (2010) the “users participate either indirectly in the innovation process, i.e. give information about their needs through surveys, for example, or participate in the innovation process at very late phase when the developed products or services are nearly completed. Users are treated as informants, not as developers. In other words, they are treated merely as objects of innovation activities, not subjects of them” (p. 66). In the second model, the main goal of the innovation activity is to produce goods and services relevant for firms and their clients. The type of innovation includes commercially exploitable innovations (technological and social), public sector innovations, incremental and radical innovations. The authors state that, “users are treated both as informants and as developers. This means that they participate also in the early phases of an innovation process, for example, in the idea and development phase. In this model, user knowledge can be as important as research knowledge” (p. 68). Initiators of the innovation process remain between the firms, universities and government. In the third model, the main goal of the innovation activity is to produce products and services relevant for public authorities and the users of the public services. Similar to the second model, the type of innovation includes commercially exploitable innovations (technological and social), public sector innovations, incremental and radical innovations. However, the initiators of the innovation process remain between the government, firms and universities. Lastly, in the fourth model, the main goal is to produce products and services relevant for citizens. The authors highlight that “besides making most of the development work, citizens also decide what kinds of innovations are needed and developed. The role of firms, public authorities and universities is, above all, to support citizens

in their innovation activities (e.g. to provide tools, information, development forums and skills needed by users in their innovation activities). Firms and public organizations also utilize the innovations made by citizens” (p. 71). The initiators of the innovation process are then only the citizens.

However, Carayannis, Barth and Campbell (2012) argue that “the Triple Helix places the emphasis on knowledge production and innovation in the economy so it is compatible with the knowledge economy. The Quadruple Helix already encourages the perspective of the knowledge society, and of knowledge democracy for knowledge production and innovation. In a Quadruple Helix understanding, the sustainable development of a knowledge economy requires a coevolution with the knowledge society” (p. 1). Setyanti (2017) highlights that “discussions on creativity and innovation performance in the creative industry applying a quadruple helix model are still limited and unclear” (p.90). However, Mulyana (2015) found that the Quadruple Helix Innovation Model has an important role in improving creativity in the creative industry. Thus, for a policy synergy to be possible between the Creative Industry and the Knowledge economy, a shift from the Triple Helix Innovation Model to the Quadruple Helix Model is necessary.

6. Public Policy for Innovation

Innovation is at the heart of economic development, social welfare, and protection of the environment. In this day and age, the need for innovation is greater than ever, and the challenge to make these three objectives compatible is tough. As more and more countries begin to formulate policies that support innovation, they need to learn from the experiences and good policy practices of dynamic economies, especially those from the developing world (The World Bank, 2010). Innovation relies considerably on overall circumstances in the economy, governance, education, and infrastructure of a country. Such framework conditions are particularly problematic in developing countries, however, experience shows not only that proactive innovation policies are achievable and effective, but also that they help create an ecosystem for wider reforms. According to the World Bank (2010) “innovation means technologies or practices that are new to a given society. They are not necessarily new in absolute terms. These technologies or practices are being diffused in that economy or society” (p. 4). Technologies in this context refers to activities related to big data, internet of things, artificial intelligence, 3D printing, biotechnology, health technology, nanotechnology, renewable energy and technologies, satellites and drones, and lastly block chain (United Nations, 2018), which all fall under the fourth industrial revolution (IR) (Figure 18). The World Economic Forum founder and executive chairman, Klaus Schwab, authored ‘The Fourth Industrial Revolution’, a book characterized today’s advances as a new revolution: the Fourth Industrial Revolution. From steam (1st IR) where machinery production started and people became urbanized, to electricity (2nd IR) where mass production increased, to computing (3rd IR) where technology automated production began, and now reaching the connectivity stage (4th IR) where technology is enhanced to serve world’s needs.

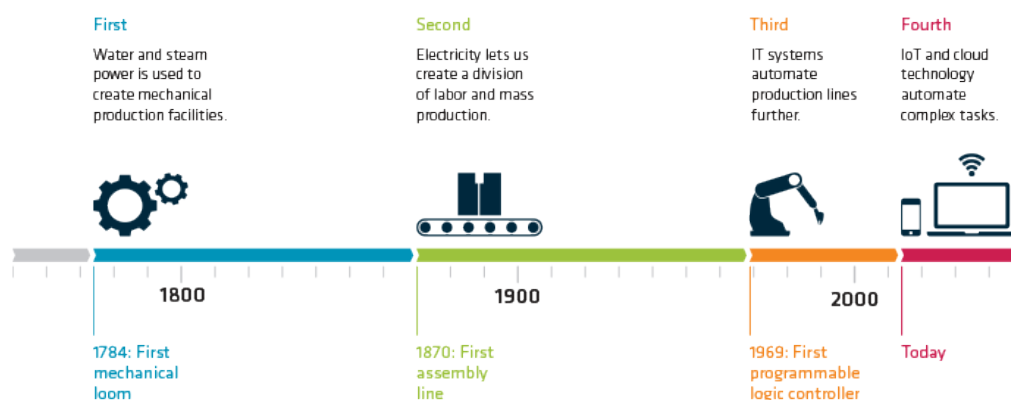


Figure 18. The Industrial Revolution Timeline (Mjølner, 2019)

Seemingly, innovation is about discovering new solutions to existing problems, as well as providing opportunities of new activities. It should benefit all people in society, including the poorest. According to World Economic Forum (2018) the key elements such as “enabling policy, infrastructure, investment, business support services and access to academic and research institutions are required to develop successful innovation ecosystems” (p. 5). As innovation takes place mainly in local milieus with a concentration of knowledge, talents, and entrepreneurs; innovation policy is an important concern of national governments that set up appropriate bodies (World Bank, 2010, p. 11). Effective innovation policy making will entail specific attention on research, education, trade and industry development, financing and other determining factors (Figure 19).

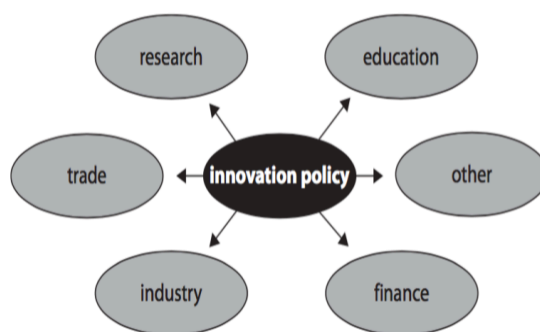


Figure 19. Model for a Strong Innovation Policy (World Bank, 2010)

While innovation remains fundamentally the work of private economic agents, the World Bank highlights that “governments facilitate the emergence and success of innovative initiatives by removing obstacles, by providing the necessary support to entrepreneurs, by investing in the needed technology and research infrastructure, and by carrying out appropriate reforms in education, the investment climate, and trade” (p. 24). Thus, it is important to consider all stakeholders in the innovation scheme of a country and to address their roles and contributions towards prosperous innovation performances within a country. The key aspects of innovation systems are the capabilities of these various actors (firms and entrepreneurs, government, universities, and civil society), the connections between them, and the enabling environment for innovation that they create (United Nations, 2018, p. 54).

Ideally, the government should be perceived as the gardener of the economy. The responsibilities of the gardener are to prepare the ground, nurture the soil, remove weeds, and water the plant (Figure 20). These dimensions of gardening are not possible without the proper sequence for successful results. In other words, one cannot water a plant (finance, support

innovators) that does not exist is merely surviving in spite of inadequate soil.. In this case the role of proactive and comprehensive government policies in establishing the overall framework (national system of innovation) and in fostering productive interaction among the stakeholders, including different parts of government, is prominent to catalyze innovation in developing countries, especially in small island nations. When it comes to watering the plant, to increase policy productivity, many industrialized countries incline to place the industry at the center of their strategies. These policies are then designed to help grow small firms and start-ups ventures. Additionally, when it comes to removing weeds, every part of bureaucratic, legislative, and regulatory procedures that directly or indirectly support or impede trade, investment (foreign and domestic), and business setup, may consequently encourage or obstruct innovative activities. Also, when it comes to nurturing the soil, developing countries should find better ways of assigning public R&D resources by determining clearer standards that fit the needs of government, universities, and business, and by developing more effective ways of monitoring and evaluation. Lastly, when it comes to preparing the ground, governments should be involved in education, informal training, and the mobilization of talented diasporas. The modification toward a knowledge-based economy makes the revitalization of education serious and challenging, especially for developing countries.

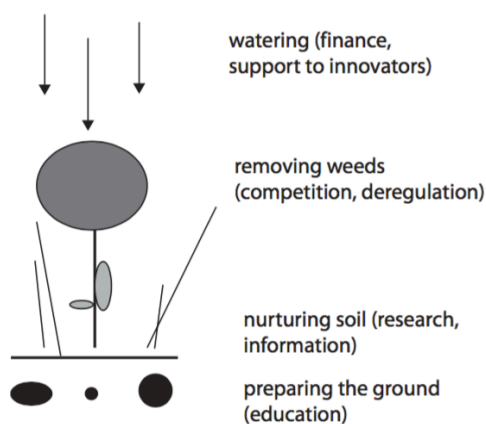


Figure 20. Gardening Innovation Policy Functions (World Bank, 2010)

Furthermore, for governments, according to World Economic Forum (2016) “it will entail innovating within education and labor-related policymaking, requiring a skills evolution of its own. For the education and training sector, it will mean vast new business opportunities as it provides new services to individuals, entrepreneurs, large corporations and the public sector. The sector may become a noteworthy new source of employment itself” (p. 29). There are many reasons why governments fail to generate welfare-enhancing economic results when it interjects itself into the economy. According to van den Berg (2016) “among them are (1) the lack of

information, (2) the self-interest of government leaders and bureaucrats, and (3) the hijacking of government power by special interests” (p. 14). Often, these failures lead to corruption or as van den Berg states as “the abuse of public power for private benefit, the incentives for government corruption are to be found in the ways that government is empowered to redirect income and wealth from some groups to others” (p. 22). These practices include: regulation, giving authorization and permits, taxation, transfers and subsidies, government expenditures, financial repression, and privatization of government assets.

Furthermore, according to the United Nations (2018) the capability of firms and entrepreneurs to “absorb new knowledge and transform it into innovation is fundamental to any effective innovation system” (p. 54). Especially, for developing countries absorptive capacity is related to the assimilation of existing knowledge and technology to the ability to engage in advanced R&D and technological innovation activities. In the eyes of Kim (1998), “absorptive capacity requires learning capability and develops problem-solving skills. Learning capability is the capacity to assimilate knowledge (for imitation), whereas problem-solving skills represent a capacity to create new knowledge (for innovation)” (p. 507) (Figure 21). Absorptive capacity depends on two factors, namely prior knowledge and the intensity of effort.

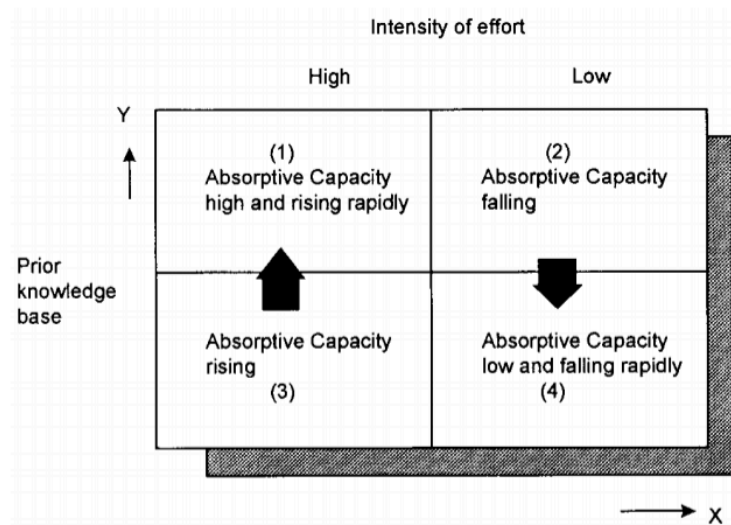


Figure 21. Dynamics Absorptive Capacity (Kim, 1998)

To develop an efficient absorptive capacity, whether it be for general knowledge or problem-solving or learning skills, it is insufficient to only expose an individual briefly to the relevant prior knowledge. Intensity of effort is critical (Cohen & Levinthal, 1990). When both factors are high (quadrant 1 in Figure 21 above), absorptive capacity is high and when both factors are low (quadrant 4), absorptive capacity is low. Firms with high prior knowledge relative to task

difficulty and low intensity of effort (quadrant 2) will gradually lose their absorptive capacity, moving rapidly down to quadrant 4, because their prior knowledge base will become outdated as task-related technology moves along its path. On the other hand, firms with low prior knowledge relative to task difficulty and high intensity of effort (quadrant 3) will be able to attain absorptive capacity, moving progressively to quadrant 1, as repeated efforts to learn and solve problems improve the level of relevant prior knowledge. In this case, according to Fagerberg and Godinho (2005) “particularly, what the developing country firm may need are “institutional instruments” that improve: (1) links with the technology frontier, (2) links with markets (and sophisticated users), (3) supply of needed skills, services and other inputs, and (4) the local innovation system/network” (p. 536). The capacities of firms to introduce innovations in local, national and international markets are a requirement for high-tech upgrading and improving the productive capacity of a country. One way capabilities of the country can be enhanced is through education and schooling, which “can improve the and research institutions. They need to respond to the learning capabilities and absorptive capacities of firms and other actors” (p. 54).

As previously mentioned, the most prominent aspect of innovation systems revolves around institutional linkages. According to van den Berg (2016), the critical technology that humans developed to manage their larger and increasingly complex societies consisted of developing social and economic institutions. In his perspective, “institutions are the wide range of formal rules and governance arrangements plus the informal norms, traditions, customs, and spiritual/ceremonial activities that constitute group culture. Institutions guide and motivate individuals to behave in ways that sustain complex social systems” (p. 2). Institutions are usually categorized as either formal institutions or informal institutions. The formal institutions are recognized by their rules, regulations, laws, and government structures that are intentionally designed and imposed to guide human behavior. While, informal institutions are the “traditions, morals, norms, beliefs, accepted myths, mannerisms, and common social behaviors” (p. 2). Aspects of socio-economic growth that is easily adaptable, include; economic activity, technology, and formal institutions. While, informal institutions (culture), the natural environment, and human evolution are considered the toughest or the most challenging aspects to change, reinforcing the role of formal institutions or public intervention in stimulating innovation.

6.1 Science, Technology & Innovation Policy

Science, technology and innovation (STI) have long driven developments in productivity, and one cannot help but observe that much of the thrust and efforts to mobilize STI for society have

focused on economic intentions such as competitiveness and economic growth. However, the current economic crisis reminds us of the importance of mustering STI not solely for generating economic benefits, but for foreseeing and reacting to societal needs (Harayama & Nitta, 2011). Out of an interest to support the creativity economy, comprehensive policies should embrace and integrate policy fields such as economy and taxes, law, competition, education, diversity, and openness. What counts is not only innovation, but the “creative knowledge”-based innovations that create new knowledge (Dubina, Carayannis, & Campbell, 2012). The OECD (2004) states that “creativity is a vital asset for innovation because innovation essentially involves the successful application of creative ideas. As a result, countries have begun to link the creative industries directly to innovation policy” (p. 42).

The overarching challenge for developing countries in reaping the benefits of STI is to learn, adopt and disseminate knowledge and technologies to promote sustainable development (United Nations, 2018). According Hoekman, Maskus and Saggi (2005) “a main priority in all types of developing countries is effective general technology policies, including improving basic education, building appropriate infrastructure, and reducing entry barriers for local firms that could be suppliers for MNEs. For local economies to gain productivity from ITT, such broader policy initiatives are important. This is a complex task that involves building human capital, expanding national innovation systems, and appropriately protecting IPR” (p. 1597). On the other hand, Goede (2009) states that “the policy implication for developed nations is that they need to focus more on people, ideas and technology. Developing nations first need to put a good policy in place to protect their citizens and property (physical and intellectual); in other words they need good governance” (p. 48). According to the United Nations (2018) STI “is not always a priority policy area in developing countries, and not all have an explicit STI strategy or policy” (p. 63). Building foundations for effective STI policy requires: (1) assuming a systemic approach to STI policy, (2) a broad definition of innovation, (3) effective priority setting, (4) mainstreaming and integration of STI policies, and (5) improved policy-making and implementation capacity. Overall, STI policy should be reinforced by a better understanding of innovation systems, to target the main market and system failures challenging innovation in local contexts. Also, many developing countries focus too narrowly on technological innovation. Innovation needs to be understood more holistically as including “new products and services, processes, organizational improvements and business models, as well as other forms of innovation, including social, pro-poor and frugal innovation” (p. 63). Furthermore, many countries have complications in instituting STI priorities and pinpointing where prospective returns to the use of public resources in STI are highest, resulting in extremely long lists of so

called priority actions that distribute resources too sparsely, making it challenging to accumulate the credibility of STI policy. Therefore, improving policy coordination across all ministries and between the government and other stakeholders is important to improve the current innovation performance in a country. This way, constructing strategic links and coordination between STI policy and other development policies (industrial policy, FDI, trade, competition, education and training, entrepreneurship and SME policies) is crucial to solidifying the improvement potential of innovation. In the end, this includes improving general policy capacity throughout the entire policy cycle, from design through implementation, to monitoring and evaluation of STI instruments and indicators. Overall, “without appropriate STI policies, no form of technology is likely to deliver progress in the global development agenda. Such progress requires an environment that nurtures learning and innovation – and the dedication of resources, time and concentrated efforts, to build and manage effective innovation systems” (United Nations, 2018, p. 54).

Policy Breakdown

According to the World Bank (2010) innovation policy is broader than, and different from, science and technology policy, with which it tends to be merged. It also takes place as part of an overall trend toward knowledge-based economic strategies. Innovation policy requires action in many different policy areas, which include education, trade, investment, finance, and decentralization, among others. In the end, it is the right combination of public interventions in these diverse domains that creates a fruitful local innovation climate. Innovation policies in “developing countries should consider specific features. Several points need to be emphasized: technology strategy, institutional issues, the legal framework, countries’ specific needs and assets, agents of change, reforms, and cultural and behavioral characteristics” (p. 68). In the ‘Oxford Handbook of Innovation’, Lundvall and Borrás (2005) explain the policy evolution between science, technology and innovation. Science policy as a concept belongs to the post-war era and is considered to contribute to areas such as, national security, health, and economic growth. The increase in investment in science was most likely the reason why World War II ended and the Cold War started. The main concerns in science policy are about allocating the appropriate resources to science, to distribute them wisely between activities, and to make sure that resources are used efficiently and contribute to social welfare. According to Lundvall and Borrás (2005) “the elements of the innovation system that are focused upon are universities, research institutions, technological institutes, and R&D laboratories. Science policy is both about the internal regulation of these parts of the innovation system and about how they link up to the

environment, not least to government and industry. However, strengthening this linkage becomes even more crucial in technology and innovation policy” (p. 7). The central policy actors in the public sector are ministries of education and research and research councils. However, sector ministries in charge of health, defense, energy, transport, and environment also have a responsibility since they arrange their individual research communities, and in some industrialized economies account for most public spending on R&D. Additionally, “ministries of finance play a role when it comes to decide the total budget for research. Civil organizations representing consumers and citizens may be invoked as corrections to a bias in favor of commercial interests” (p. 8).

On the other hand, technology policy refers to policies that focus on technologies and sectors. The technology policy was introduced when “science-based technologies such as nuclear power, space technology, computers, drugs and genetic engineering are seen as being at the very core of economic growth” (p. 9). Interestingly, especially when considering that Aruba is a small island state, Lundvall and Borras highlight the fact that technology policy could mean different things for smaller and bigger countries, as well as for catching-up countries and high-income countries. In bigger high-income countries, the emphasis will be on determining the capacity of producing the latest science-based technologies, as well as applying them. However, in smaller countries the emphasis will be on “being able to absorb and use these technologies as they come on the market. Catching-up countries may make efforts to enter into specific promising established industries using new technologies in the process of doing so” (p. 10). The United Nations (2008) suggested that “increasing the absorptive capability of domestic knowledge systems requires three major types of policy measure: (1) there is a need for education and training which increases the pool of relevant human skills; (2), there is a need for incentives to promote the development of technological learning and innovation routines within domestic firms. (3) there is a need for the creation of a set of institutions which increase knowledge linkages among domestic firms, between foreign firms who have invested in LDCs and domestic firms, and between domestic firms and the rest of the world” (p. 73).

Now, the principal elements within this SI include universities, research institutions, technological institutes, and R&D laboratories. However, “the attention moves from universities toward engineering and from the internal organization of universities toward how they link to industry. Technology policy may go even further and include the commercialization of technologies, but then we approach what we will call innovation policy” (p, 11). While, the central policy actors in the public sector may vary per country, it remains central across the board for ministries that are procuring technology related to telecommunications, health,

defense, energy, transport, industry and trade, education and research, and sustainable development. As indicated, “science and technology policy are ideal types, which serve our broad analytical purposes. In the real world of advanced capitalist economies, however, the policy focus, instruments and actors involved in science and technology policy-making are not always easily grouped in one or the other of these categories. As we will examine now, innovation policy takes a step further by bringing in an even broader set of policy issues” (p. 13).

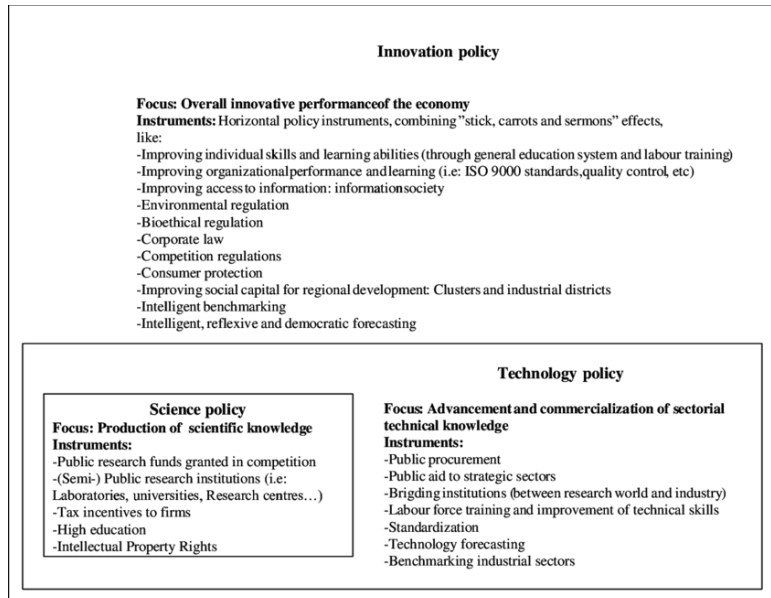


Figure 22. Relationship Between Science, Technology and Innovation Policies (Lundvall & Borrás, 2005)

Lastly, innovation policy occurs in two ways, namely the laissez-faire version or through the systemic version, referring to the “system of innovation” concept. The former highlights non-interventionism and indicates that the attention should be on “framework conditions” rather than sectors or technologies, whereas the latter focusses on linkages between all contributing actors in the system. However, both approaches cover crucial aspects of the innovation process, including diffusion, use and marketing of new technologies. They are seen as an important form of “economic policy” where the attention is more on innovation rather than allocation. Both tend to put a stronger emphasis on the importance of “institutions” and “organizations” compared to science and technology policy. Therefore, the systems approach “introduces a vertical perspective on the industrial system, seeing it as a network and as value chains where certain stages might be more suitable for firms in a specific country” (p. 14). The main objectives of innovation policy are solely on economic growth and international competitiveness. These objectives are combined with social cohesion and equality, especially in the EU. In this case, innovation is considered a way to solve imperative problems related to pollution, energy,

urbanism, and poverty. However, the focus remains on the creation of economic wealth. “Innovation policy pays special attention to the institutional and organizational dimension of innovation systems, including competence building and organizational performance. Innovation policy calls for “opening the black box” of the innovation process, understanding it as a social and complex process” (p. 16).

Also, Edler and Fagerberg (2017) distinguish three different types of innovation policy, namely: (1) mission-oriented policies, (2) invention-oriented policies, and (3) system-oriented policy. Mission-oriented policies practically deliver new solutions focussed on specific socio-economic challenges that are on the political agenda, while invention-oriented policies have a narrower scope, because they focus on the R&D/invention phase, leaving the possibility of exploitation and diffusion of inventions. The last one, system oriented policies focus on system-level features, such as: the degree of collaboration between different parts of the system, the extent to which some vital piece of the system is in need of upgrading, or the competences of the stakeholders involved. This relates to the second type of innovation policy indicated by Lundvall and Borras (2005) which refers to the “system of innovation” concept. Taking into account the conceptual elements of recent innovation reports, Aruba swings between the mission-oriented and the system-oriented policy type. In a systems model of innovation, according to the United Nations’s Least Developed Countries Report (2007), the capacity of an enterprise to innovate depends on its access to knowledge from research institutes or technology services centres, but also aspects such as: access to financial capital, human capital, suitable infrastructure, firm-level proficiencies, inter-firm linkages and collaboration, business services, demand conditions, investment climate, cultural propensity towards entrepreneurship, and ample levels of literacy. Seemingly, when it comes to intervening withing the creative industries, Benavente and Grazzi (2017) agree that “governments need to follow a systemic approach, meaning that it is essential that programs operate on all the components of the creative ecosystem. This requires a policy mix comprising different instruments to simultaneously stimulate supply, demand, and interaction among the various actors” (p. 41).

Now, considering innovation policy ideals, the government can intervene in different ways by making use of instruments that can serve to reach specific goals. In Figure 8, fifteen innovation policy instruments are illustrated. The table primarily differentiates between instruments that focus on the supply of or the demand for innovation. It also considers a variety of innovation policy goals and implies how the various innovation policy instruments relay to these main goals. Several of these instruments relate to more than one goal and several goals are tackled by more than one instrument. These goals include increasing R&D, skills development,

access to expertise, improving systemic capabilities, enhancing demand for innovation, improving framework, and improving discourses. Overall, Lundvall and Borrás (2005) indicate that in the most recent debates about the knowledge-based society one can comprehend the contours of a new policy that we might call “knowledge policy”, which “recognizes that innovation and competence building involve many different sources of knowledge and that innovation itself is a learning process. This raises the need for new analytical efforts and for rethinking the organization and implementation of policy in several respects” (p. 26). According to the UNESCO (2015) in the latest Science Report, islands in the Caribbean, up until now, “have not managed to put in place and implement effective policy frameworks to propel STI. Consequently, important challenges in the region related to energy, water and food security, sustainable tourism, climate change and poverty reduction are not getting the level of input from the scientific enterprise required to make a difference” (p. 172).

In a similar fashion, in the ‘Least Developed Country Report’ by the United Nations (2008), STI policies in Least Developed Countries (LDCs) “need to be founded on a strategic vision for national economic development and integrated within their national development strategies. In general terms, such strategies will involve concerted efforts to increase domestic value-added, productivity and international competitiveness by increasing the knowledge content of economic activity and to promote diversification through learning and innovation” (p. 63).

| Innovation policy instruments | Overall orientation | | Goals | | | | | |
|---|---------------------|--------|--------------|------------------|---------------------------|--|------------------------|-------------------|
| | Supply | Demand | Increase R&D | Skills expertise | Access to complementarity | Improve systemic capability, demand for innovation | Enhance framework work | Improve discourse |
| 1 Fiscal incentives for R&D | *** | | *** | **○ | | | | |
| 2 Direct support to firm R&D and innovation | *** | | *** | | | | | |
| 3 Policies for training and skills | *** | | | *** | | | | |
| 4 Entrepreneurship policy | *** | | | | *** | | | |
| 5 Technical services and advice | *** | | | | *** | | | |
| 6 Cluster policy | *** | | | | | *** | | |
| 7 Policies to support collaboration | *** | | **○ | | **○ | *** | | |
| 8 Innovation network policies | *** | | | | | *** | | |
| 9 Private demand for innovation | | *** | | | | | *** | |
| 10 Public procurement policies | | *** | **○ | | | | *** | |
| 11 Pre-commercial procurement | **○ | *** | **○ | | | | *** | |
| 12 Innovation inducement prizes | **○ | **○ | **○ | | | | **○ | |
| 13 Standards | **○ | **○ | | | | | **○ | *** |
| 14 Regulation | **○ | **○ | | | | | **○ | *** |
| 15 Technology foresight | **○ | **○ | | | | | | *** |

Notes: *** = major relevance, **○ = moderate relevance, and *○ = minor relevance to the overall orientation and stated innovation policy goals of the listed innovation policy instruments.

Figure 23. Innovation Policy Instruments (Edler & Fagerberg, 2017)

In conclusion, the United Nations (2008) Least Developed Country Report summarizes that: (1) STI policy should focus on promoting technological learning and innovation within enterprises. This is best accomplished with a systems model of innovation rather than a linear model, (2) The main objective of STI policy should be to encourage technological catch-up with more advanced countries. Successful developing countries have adopted policies to stimulate technological learning and innovation which are aimed towards accomplishing technological catch-up with developed countries, (3) STI policies need to fit to the level of technological development, economic structure and capabilities of the government and business sector of the LDCs, (4) LDC governments have weak capacities to formulate and implement STI policies within development strategies. But this does not mean that such capacities cannot be developed. Lundvall and Borrás (2005) finalize by restating that in SIDS and developing countries the institutional structure “that affect absorption and efficient use of technology are more important to understand and act upon than those promoting the production of the technologies at the front. Big countries will necessarily be more focused on the production of the new technologies, but they too would have much to gain from taking into account the absorption and efficient use of innovations and new knowledge” (p. 27-28).

7. Methodology

Q-methodology, first introduced by psychologist and physicist William Stephenson (1902-1989), is a progressively popular method to extract individual perspectives systematically and to analyze the overlap and differences between them by means of quantitative correlation analysis (Hermans, Kok, Beers, & Veldkamp, *Assessing Sustainability Perspectives in Rural Innovation Projects Using Q-Methodology*, 2011). It also has the aim of providing a foundation for the systematic study of subjectivity (Brown, 1993). The Q- methodology in this respect is expected to map how various stakeholders think about the synergy between the creative industry and knowledge economy and provide deeper understanding of the opinions of how this synergy could potentially foster increased innovation in Aruba. Q-Methodology is considered a participatory policy research instrument and is particularly suited for the study of issues that are socially contested, argued about and debated in society. Hence, the use of Q-methodology becomes relevant for this current study. Even though Q-methodology developed its roots in psychology, over the years it has been used in various academic disciplines well beyond psychology, such as policy making fields in health studies, engineering (STEM), political science, education, environmental research, and journalism. Technically, Q-methodology is an application of factor analysis, whereas normal factor analysis (also referred to as R-methodology) searches for correlations between variables across a sample of subjects, Q-methodology looks for correlations between subjects across a sample of variables (van Duin, Slabbekoorn, Tavasszy, & Quak, 2018) . The biggest differences between Q-analysis and R-analysis is that Q-methodology is used to describe a population of viewpoints and not people. Noticeably, Q-methodology does not require many subjects, thus perfect for research in local community contexts. Also, given the global presence of relatively low-cost “main frame” statistics programs to accompany them, Q-studies can be readily conducted by anyone with a basic knowledge of research statistics (McKeown & Thomas, 1988).

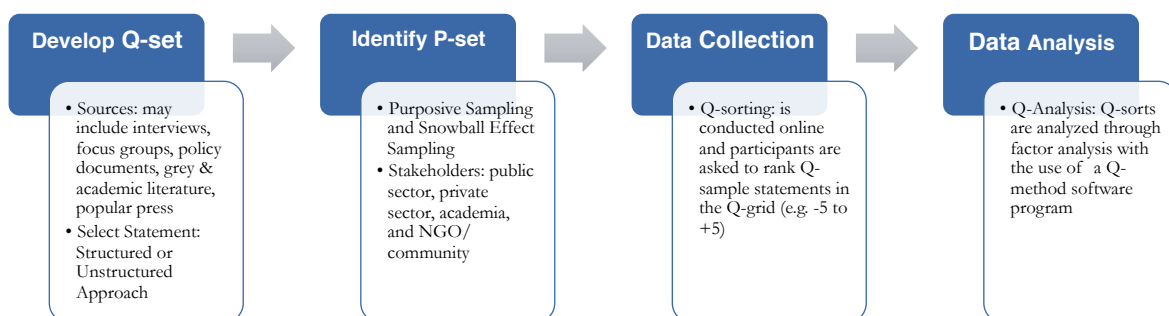


Figure 24. Q-methodology Process

Furthermore, when comparing Q-methodology to other common methods in social sciences, such as surveys and questionnaires, there are some principal differences. First, according to Hermans et. al (2011) “the concepts do not depend on previously constructed scales that measure some predetermined traits of respondents in the way in which surveys and questionnaires are usually constructed. This means that in Q-methodology the respondents are doing the measuring, instead of being measured” (p. 74). Second, there are two other issues with using surveys and questionnaires in this research context: (1) the same words or phrases may actually mean different things to different individuals and (2) most people understand certain statements in the context of other statements that are included in a questionnaire. Q-Methodology has been considered a research method that combines the strong traits of both qualitative and quantitative research elements, thus providing researchers with a systemic way of analyzing human subjectivity. According to Saeed Bashatah (2016) “whereas the quantitative approach requires a large sample to obtain general findings, the qualitative approach investigates a small population in depth. In contrast, Q-methodology mixes both approaches by using a small sample of participants (compared with the quantitative approach) to obtain profound findings” (p. 39). Also, Q-methodology has the identical degree of mathematical precision as quantitative methodology, as it delivers for direct measure, and it has an interpretive element equivalent to that of qualitative methodology. Seemingly, Weber, Danielson and Tuler (2009) express that “benefits of using Q-method include: clarity of the positions of the stakeholders, individuals can better understand their own thinking on an issue, better understanding of the perspectives that exist, it can help inform survey research and it is not difficult to grasp” (p. 36-37). Overall, through the use of this methodology, this research aims to open doors to more inclusive research methods. Effective policy making requires the participation of all relevant stakeholders who in one way or other have impact on society.

7.1 Conducting Q-methodology

According to van Excel & de Graaf (2005) conducting an Q-methodological study includes the following steps: “(1) definition of the concourse; (2) development of the Q-set (Q sample); (3) selection of the P set; (4) Q sorting; and (5) analysis and interpretation” (p. 4). But, for the purposes of this study, it will be combined into four steps, by merging step one and two together. A comprehensive and detailed discussion of each step is provided in the following sections of this chapter.

Step 1: Developing the Q-Set

In Q-methodology, according to Brown (1993) “the flow of communicability surrounding any topic is referred to as a concourse and it is from this concourse that a sample of statements are drawn for the administration in a Q-sort” (p. 95). Ideally, the concourse is the collection of all the possible statements and discourses on the research topic. In this research, statements are collected from three outlets, namely, policy reports, grey and academic literature, and the media (i.e newspapers, radio, and social media). Also, according to Excel & de Graaf (2005) “the gathered material represents existing opinions and arguments, things lay people, politicians, representative organizations, professionals, scientists have to say about the topic; this is the raw material for a Q-methodology” (p. 4). The concourse for this research consists of a total of 300 statements. From the concourse, a Q-sample is derived reaching 40 statements (Appendix 1), which will be used in the Q-sorting process by the participants. Q-samples can be distinguished in two ways according to McKeown & Thomas (1988), naturalistic and ready-made Q-samples, where gathered statements from a respondents' oral or written communications are considered naturalistic. In a naturalistic situation, the researcher performs a first round of interviews to collect their concourse. However, “those drawn from sources other than their own communications are ready-made. Items from both also can be combined in hybrid samples. Neither is inherently superior to the other; one should select the type best suited to the research at hand” (p. 2). In this research, the Q-sample is ready-made through usage of published information. Furthermore, there are two basic methods for choosing statements, a structured sampling method and an unstructured sampling method. This research will combine these two methods and will choose statements through a semi-structured sampling method with an inductive design (emerged from observed patterns as statements are collected), in a way to provide enough flexibility, but to also ensure that there is balanced sample. The 40 statements are distributed through 10 themes as illustrated in Figure. 25 below.

All statements (40) derived from the concourse (300) into the Q-sample are organized into three categories, namely (1) Definition, (2) Perspective, and (3) Opinion. These categories indicate the type of statement by category. The definition category focusses on statements that provide general descriptions of certain concepts or themes used in this study. The prescriptive category, on the other hand, contains all statements that are suggestive in nature and are easily identifiable by as they include the word ‘should’. Lastly, the opinion category, indicates all statements that provide fact-based information on the research topics and themes. From the 40 statements in the Q-sample, 14 (35%) of them are definition-based statements, 15 (38%) are opinion-based statements, and 11 (27%) are prescriptive-based statements.

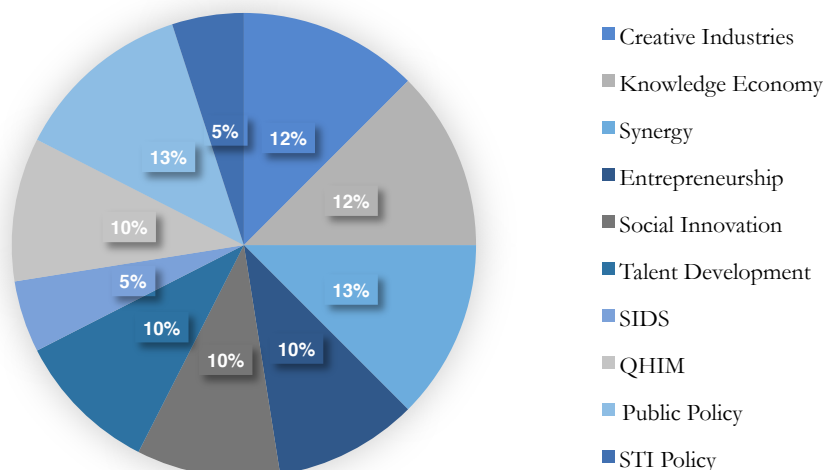


Figure 25. Thematic Distribution

Step 2: Identifying the P-set

The following stage within the Q-method concerns the selection of the P-set, meaning the respondents who participate in the research by ranking the statements (Q-sample). All parties who are expected to have an individual view on the topic need to be included in order to record as many individual perspectives as possible (van Duin, Slabbekoorn, Tavasszy, & Quak, 2018). The P-set is not a random compilation of people; thus, a purposive sampling method is used in the participation selection process of this study. All respondents who were approached are theoretically relevant to the topic under consideration; for instance, persons who are expected to have a particular viewpoint regarding the topic and, in that quality, may define a factor (van Excel & de Graaf, 2005). The P-set of this research consists of representation of government and public organizations, the private sector relevant to the creative industry and knowledge economy, academic institutions relevant to the creative industry and knowledge economy, and finally, relevant NGOs and community.

A total of 55 prospective participants were approached to be part of this research, however, the response rate equaled 73% (40 respondents). From these 40 respondents, only 70% completed the entire sorting process (both filling in a consent form and performing the Q-sort). This means the P-set for this research consists out of 28 participants, with the majority being female participants, where 39% represent the public sector, 21% represent the private sector, 14% represent academia, and 25% represent NGOs and the community (Figure 26). Also, considering the educational level of the P-set, from the 28 respondents 11% has a VWO level high school degree, 21% has a Bachelor degree, 57% has a Master’s degree, and 11% has a PhD degree.

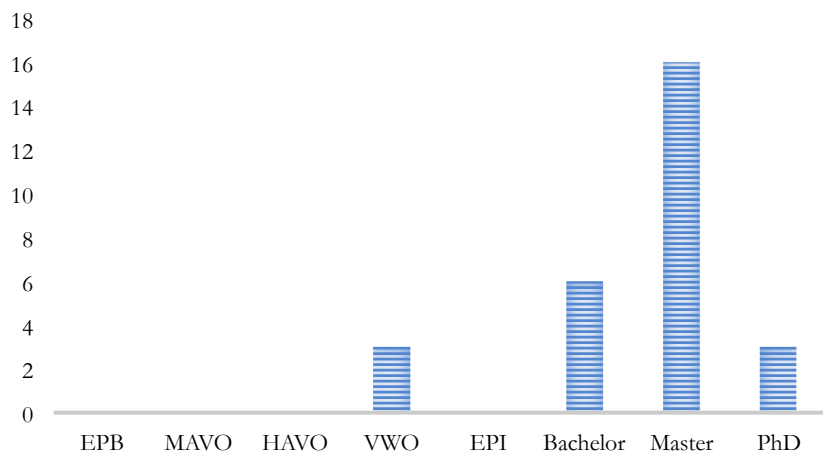
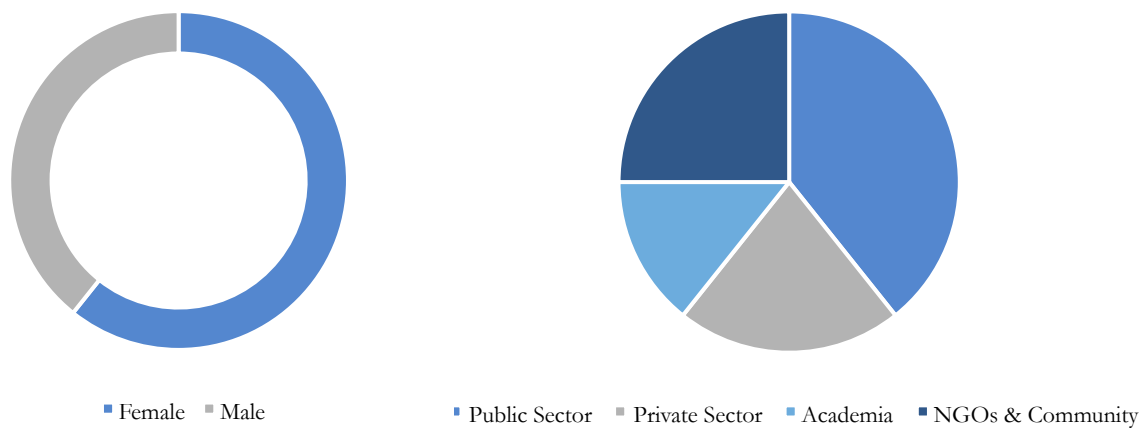


Figure 26. P-Set per gender, sector, and education level

Step 3: Q-sorting Application

Typically, in a Q-method study people are presented with a sample of statements about a specific topic, called the Q-set. Respondents, called the P-set, are asked to rank-order the statements from their individual point of view according to their personal preference, judgement or feeling about them, mostly using a quasi-normal distribution, a process called Q-sorting (van Excel & de Graaf, 2005). Normally, this process is conducted personally, but in the case of this study, it is performed online with the use of the Q-sortware software program, which is designed for conducting online Q-methodology studies. Respondents who confirm their participation receive two links through e-mail and are asked to follow the instructions provided by the researcher through a participation guide booklet. These two links include the online consent form and the

Q-sorting link to the Q-sortware software. Once, the consent form is filled out, the participant can continue to sort the 40 statements. The Q-sortware software is programed in a way that provides the participant a sequence of different steps.

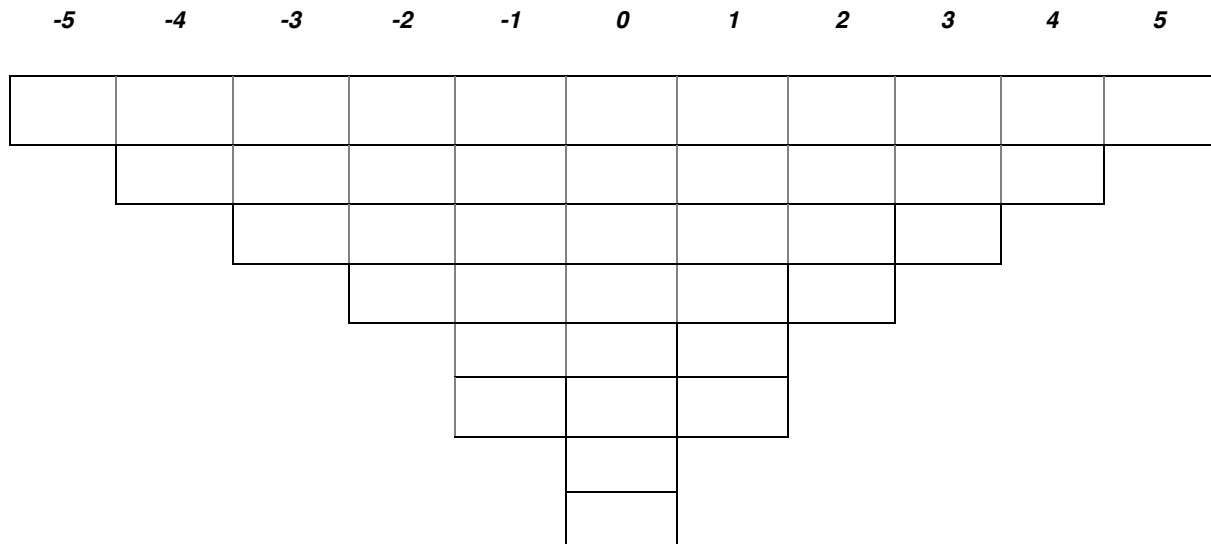


Figure 27. Q-Grid for 40 Statements

The first part will collect all demographic data from the participants. Then the Q-sortware provides the opportunity for the participant to experience an “initial sort”. The initial sort serves as a practice round in sorting statements and helps the participant identify their opinions on the statements before completing the actual Q-sorting. In this stage, the sorting includes three columns ranging from -1 to 1 (disagree, neutral, agree). Once the initial sort is finalized the participant is guided to the final sort. The software provides a visualization of a digital grid which simulates the Q-grid (Figure 27), illustrating a distribution of the 40 statements, providing a more dispersed range from -5 to 5 compared to the initial sort. All sections within the Q-Grid is expected to be assigned a statement to be valid and complete. The participants are then asked to sort all the 40 statements in the columns. Once finalized, all Q-sorts are collected through the Q-sortware software and stored in the data base and are ready for analysis.

Step 4: Performing Q-analysis

The data analysis of the results of the 28 different Q-sorts is completed with the use of the PQMethod 2.35 software, which is the latest updated version available since 2014. After establishing the project name, users have the disposition of seven different analysis sections: (1) STATES, (2) QENTER, (3) QCENT, (4) QPCA, (5) QROTATE, (6) QVARIMAX, and, lastly (7) QANALYZE. Before starting the analysis, the preparatory work needs to be completed and

the data collected should be inserted into the program, which is completed in section 1 and 2 of the program. In the section 1 (STATES) all 40 statements are entered and edited accordingly, while in section 2 (QENTER) all 28 Q-sorts are inserted manually following the normal distribution that ranges from -5 to 5 (Appendix 2). From the Q-sortware software, the output is gathered per statement and are then organized per sort for functionality purposes. After the foundation has been established for the analysis, a factor analysis is performed using both the Centroid Factor Analysis, section 3 (QCENT), and the Principal Components Factor Analysis, section 4 (QPCA). This is followed by section 6 (QVARIMAX), which consists of the rotation of the factors provided by section 3 and 4. Lastly, section 7 (QANALYZE) provides the complete analysis with the remaining data ready for interpretation and discussion.

Factor analysis

The first option for running the factor analysis is the centroid factor analysis (CFA), which is an option for extracting un-rotated factors next to principal components analysis (PCA). However, according to Scholck (2014), “centroid analysis, is not much used outside the Q community nowadays, whereas principal components analysis is the default method of factor extraction in statistical packages” (n.p). Scholck also indicates that the QCENT offers two methods, the Brown developed in 1980 or the Horst method in 1965. In this research, the Horst method is chosen, “because it did not show certain irregularities that were found with the customary Centroid method”, where the Centroid analysis is based solely on the commonality among Q-sorts and ignores the specificity of individual sorts (Scholck, 2014, n.p).

Another option for running the factor analysis is the principal components analysis (PCA), which computes and outputs all eigenvalues and corresponding percentage figures. The importance of these absolute and relative sizes of the eigenvalues are significant since it helps in deciding how many factors should be kept for the rotation stage of the analysis. Centroid analysis is based solely on the commonality among Q-sorts and ignores the specificity of individual sorts. PCA, in contrast to CFA, considers both commonality and specificity (Webler, Danielson & Tuler, 2009, p.29). The PCA was performed through the QPCA function and resulted in 8 factors with an eigenvalue greater than 1 (Table 7). Eigenvalues measure the contribution of a factor to explain the overall variance in the correlation matrix, values above 1 are considered to explain more than an individual variable, thus indicating a social perspective (factor), which is suggested to be included for rotations (van den Bergh, 2017, p. 38). This also highlights the advantage PCA brings with eigenvalues which help decide on the most defining factors. Therefore, it was decided that for this study the preferred method was the PCA rather than the CFA.

Table 7. Eigenvalues (QPCA)

| Eigenvalues | | % | Cum. % | Eigenvalues | | % | Cum. % |
|--------------------|---------------|----------|---------------|--------------------|--------|----------|---------------|
| 1 | <i>9.4486</i> | 33.7451 | 33.7451 | 15 | 0.4294 | 1.5335 | 92.6568 |
| 2 | <i>2.4502</i> | 8.7508 | 42.4959 | 16 | 0.4156 | 1.4842 | 94.1410 |
| 3 | <i>2.1425</i> | 7.6516 | 50.1475 | 17 | 0.3327 | 1.1882 | 95.3293 |
| 4 | <i>1.7894</i> | 6.3908 | 56.5384 | 18 | 0.2583 | 0.9225 | 96.2518 |
| 5 | <i>1.7023</i> | 6.0795 | 62.6179 | 19 | 0.2129 | 0.7603 | 97.0121 |
| 6 | <i>1.4539</i> | 5.1924 | 67.8102 | 20 | 0.1900 | 0.6787 | 97.6908 |
| 7 | <i>1.1637</i> | 4.1559 | 71.9661 | 21 | 0.1727 | 0.6167 | 98.3075 |
| 8 | <i>1.0484</i> | 3.7442 | 75.7104 | 22 | 1.1273 | 0.4548 | 98.7623 |
| 9 | 0.9369 | 3.3460 | 79.0564 | 23 | 0.1053 | 0.3759 | 99.1382 |
| 10 | 0.8478 | 3.0280 | 82.0843 | 24 | 0.0718 | 0.2564 | 99.3945 |
| 11 | 0.7520 | 2.6859 | 84.7702 | 25 | 0.0676 | 0.2414 | 99.6359 |
| 12 | 0.6790 | 2.4251 | 87.1953 | 26 | 0.0522 | 0.1865 | 99.8224 |
| 13 | 0.5822 | 2.0793 | 89.2746 | 27 | 0.0295 | 0.1055 | 99.9279 |
| 14 | 0.5176 | 1.8487 | 91.1233 | 28 | 0.0202 | 0.0721 | 100 |

After performing the PCA, several varimax rotations were performed with factors changing from 8 to 4 to better understand the data and to decide how many factors will be used for the final analysis. Noticeably, in Table 8, in a 5-factor rotation factor 4 is considered a “bipolar factor” as P11 loads negatively on factor 4 (-0.75) and P02 loads positively on factor 4 (0.66). This highlights that the Q-sort of P11 represents a “mirror image” of P02’s Q-sort, meaning they have opposite views. Even though this does not cause problems for interpretation, it is imperative to keep this bipolar element in mind when interpreting the factor later. The factor selection criteria include looking at simplicity, clarity, distinctiveness and stability. There is no one objectively correct number of factors to use, and any number of factors will give you some insight into how people think about the issue (Webler, Danielson & Tuler, 2009, p. 32). Factor loadings are the degree to which an individual’s sort correlates with a factor. Loadings can theoretically range from 1 (complete agreement) through 0 (no agreement) to -1 (complete disagreement). However, only loadings above 0.5 or below -0.5 are considered significant and are thus marked as a defining sort. Altogether, the factors explain 63% of variations among the 28 Q-sorts and all sorts loaded statistically significant on a factor.

A ‘flagged’ loading is marked with an “X” (automatically done through the software), which indicates those sorts that load highly (positively or negatively) on each factor. Simplicity refers to the general preference of having fewer factors. Whereas, clarity refers to minimizing the number of “confounders (people who load on multiple factors) and “non-loaders” (people who do not load on any factor). In this situation, distinctiveness refers to the general preference of having lower correlations between factors, as highly correlated factors are saying similar things.

Whereas, stability refers to identifying which number of factors produces the best result for interpretation and considers trends such as clustering of sorts. Table 9 presents the comparison between different factors based on the amount of ‘flagged’ sorts, the amount of ‘non-loaders’, and the percentage explained. Clearly, 8 factors produce the highest amount of explanation, but it is also the lowest number of ‘flagged’ sorts.

Table 8. Factor Matrix (X indicating defining sort)

| QSort | 1 | 2 | 3 | 4 | 5 |
|--------------|-----------|-----------|-----------|----------|-----------|
| P01 | -0.10 | 0.55X | 0.39 | 0.04 | -0.07 |
| P02 | 0.14 | 0.30 | 0.19 | 0.66X | -0.09 |
| P03 | 0.15 | 0.60X | 0.30 | -0.01 | 0.35 |
| P04 | 0.12 | 0.25 | 0.55X | -0.14 | 0.21 |
| P05 | 0.07 | 0.24 | 0.74X | -0.16 | -0.10 |
| P06 | -0.04 | 0.08 | -0.02 | 0.18 | 0.78X |
| P07 | 0.04 | 0.36 | 0.80X | 0.03 | -0.06 |
| P08 | 0.73X | -0.13 | 0.21 | 0.08 | 0.07 |
| P09 | 0.26 | 0.11 | 0.74X | 0.28 | 0.02 |
| P10 | -0.07 | 0.74X | 0.04 | 0.03 | -0.08 |
| P11 | 0.03 | 0.22 | 0.26 | -0.75X | -0.02 |
| P12 | 0.39 | 0.14 | 0.70X | 0.02 | 0.02 |
| P13 | 0.18 | -0.16 | 0.59X | -0.002 | 0.40 |
| P14 | -0.16 | 0.44 | 0.23 | 0.40 | 0.10 |
| P15 | 0.02 | 0.18 | 0.70X | -0.21 | 0.37 |
| P16 | 0.41 | 0.49 | 0.48 | 0.16 | 0.02 |
| P17 | 0.60X | 0.44 | 0.15 | 0.10 | -0.001 |
| P18 | -0.25 | 0.33 | 0.53 | 0.53 | 0.20 |
| P19 | 0.59X | 0.28 | 0.43 | -0.20 | 0.08 |
| P20 | 0.19 | -0.08 | 0.68X | 0.09 | 0.38 |
| P21 | 0.25 | 0.29 | 0.68X | 0.06 | 0.12 |
| P22 | 0.28 | 0.74X | 0.01 | 0.02 | 0.40 |
| P23 | -0.15 | -0.004 | 0.63X | 0.23 | 0.29 |
| P24 | 0.27 | 0.14 | 0.60X | 0.42 | 0.21 |
| P25 | 0.52X | -0.01 | 0.15 | -0.07 | 0.44 |
| P26 | 0.06 | 0.04 | 0.26 | -0.28 | 0.65X |
| P27 | -0.56 | 0.26 | 0.36 | 0.10 | 0.40 |
| P28 | 0.16 | 0.23 | 0.52 | 0.20 | 0.54 |
| % | 10 | 12 | 24 | 7 | 10 |

However, 5 factors produce the highest number of ‘flagged sorts’, but is not necessarily producing the lowest amount of explanation. Now, looking at the stability of the results, with 8 factors the results are not strong, because there are some factors that do not have distinguishing statements, whereas with 5 factors this is not the case. Furthermore, the correlation between the factors are also a crucial component for identifying which factors should remain. This means that factors with a high correlation express similar perspectives, while when there is little to no correlation between factors, it could make finding common grounds more difficult. For the 8-

factor rotation, there are relatively weak correlations between factors 1 and 3, 3 and 4, 4 and 8, and 2 and 8. Also, factors 7 and 2, 7 and 4, and 6 and 5 correlate moderately with each other, while factors 7 and 8 have an extremely low correlation.

Table 9. Factor Characteristics

| N | Defining Sort | Not Defining Sort | % Explained | Results |
|----------|----------------------|--------------------------|--------------------|----------------|
| 8 | 17 | 11 | 75% | limited |
| 7 | 21 | 7 | 71% | limited |
| 6 | 18 | 10 | 67% | moderate |
| 5 | 23 | 5 | 63% | stable |
| 4 | 20 | 8 | 57% | moderate |

Note: results – the presence of distinguishing and consensus statements

On the other hand, Table 10 suggests a relatively positively weak correlation between factors 1 and 2, 3 and 5, 2 and 5 while factors 1 and 3 have a moderately positive correlation. Furthermore, factors 3 and 2 also correlate moderately, while most factors barely don't correlate with factor 4, and, factor 3 even has a minor negative correlation. According to Webler, Danielson, & Tuler (2009) “lower correlations between factors are better, as highly correlated factors are saying similar things. Nevertheless, it is not necessarily bad to have high correlations, as long as the factor is otherwise satisfactory” (p. 32). Overall, considering the simplicity, clarity, distinctiveness and stability elements of the results, the 5-factor rotation was chosen instead of the 8-factor rotation (as indicated by the PCA) for the remaining analysis.

Table 10. Factor Correlation

| F | 1 | 2 | 3 | 4 | 5 |
|----------|----------|----------|----------|----------|----------|
| 1 | 1 | 0.3273 | 0.5226 | 0.0008 | 0.1960 |
| 2 | 0.3272 | 1 | 0.4387 | 0.0116 | 0.2630 |
| 3 | 0.5226 | 0.4387 | 1 | -0.0114 | 0.2947 |
| 4 | 0.0008 | 0.0116 | -0.0114 | 1 | 0.0318 |
| 5 | 0.1960 | 0.2630 | 0.2947 | 0.0318 | 1 |

7.2 Reliability and Validity

On issues of validity, reliability, and generalizability, Brouwer, Thomas and Baas (1993) indicate that “traditionally, validity has not been an issue in Q-methodology” considering the little presence of a criterion for a person's own view point (p. 3). However, because Q-methodology is usually a small sample investigation of human subjectivity based on sorting of items of unknown reliability, results from Q method studies have often been criticized for their reliability and hence the possibility for generalization. The most important type of reliability for Q-method is

replicability will the same condition of instruction lead to factors that are schematically reliable – that is, represent similar viewpoints on the topic - across similarly structured yet different Q-samples and when administered to different sets of persons. Studies by Brouwer et. al (1993) do conclude that the Q and R analysis do show similarity and, therefore, interprets validity and generalizability. In Q-method studies, validity and reliability can be implemented, but in different ways, such as by asking the same participant to sort the statements more than once; alternatively, validity and reliability sometimes emerge after the data analysis is completed, if similar factors arise.

7.3 Ethical Considerations

All research projects have an obligation to pay attention to ethical guidelines and this is no exception for this research. To uphold the ethical guidelines, all proposed participants will be approached with a formal letter requesting their participation in the research, which includes a research information booklet explaining all important details the participant should be aware of before agreeing to participate. This research information booklet elaborates on the research topic, the relevance of the research, and the chosen research methodology. Upon agreement to participate, all participants are asked to sign an online consent form indicating their permission for the data to be used for the purpose for which the data is collected. These precautions reassure that the information retrieved through the data collection process is treated confidentially. Furthermore, throughout the data analysis process, participants are identified by a codified name instead of their given names and will be listed as such within the results chapter of this report. All these procedures are in place to ensure ethical transparency and that the data collection is conducted without prejudice and bias.

8. Results

The Q-sorts of the participants who significantly were flagged on a specific factor (Table 8) are used to a weighted average of the statements. The higher the value of the participant's sort, the higher the weighted average. However, not all factors contain the same number of respondents (look at percentages explained in Table 8), so the factors are normalized through the calculation of Z-scores to be able to compare them accordingly. Z-scores are measures of how far a statement lies from the middle of a distribution (units of standard deviations). These Z-scores together with the corresponding grid position are presented in Table 18. In order to interpret the results, the most distinguishing statements of each factor are calculated by the software. According to Hermans, Kok, Beers and Veldkamp (2011) distinguishing statements are "statements of a factor that are placed on a significantly different location on the Q-sort grid (calculated at the $P < 0.05$ level). These statements are thus the most indicative of the unique perspective captured by the factor. However, it is important to note that the other statements also contain information that is useful for the interpretation of the factor scores, even though they may also be present in the other perspectives to a certain extent" (p. 79). In this case both the distinguishing statements and any relevant other statements are used for the interpretation of the factor scores below.

Factor 1: The Team Players

Consisted with the results presented in Table 11, 12 and 13, the four participants that form the first perspective have a strong opposition on the current definition of the two economies, especially when it comes to the creative industries to which they strongly disagree (2 and 7). They *do not agree* that the creative industries should only include "art & music, graphic design, photography, web design, art studios and fashion" and they do not agree that the knowledge economy should only include "solar energy, ocean technology & cooling, higher education & export, and ICT island based solutions efficiency and innovation for export". Other factors of disagreement include that they *strongly disagree* that the Aruban creative industry should be based on the completion model (3) or the fact that they *moderately agree* that it should be based on the growth model (4). However, they do consider the creative industry an industry and not an innovation system (5). In their perception, they *disagree* that "innovation is more relevant to the private than the public sector" (22). Also, they *disagree* with the concept of sustainable entrepreneurship, where entrepreneurs solve societal and environmental problems (21) and *slightly disagree* with the concept of ecopreneurship, where entrepreneurs solve environmental problems through economic value creation. Other areas of *slight disagreement* are in the capacities

and the maturity level of economies and firms to innovate (15 and 37). The characteristics of inclusivity and a more diverse and holistic approach, are the most important aspects of this factor brought forth, and the reason why participants resonating with that are considered to be “the Team Players”. As Team Players, these participants indicated that they *extremely agree* with the statement that “it is important to consider all stakeholders in the innovation scheme of a country and to address their roles and contributions towards prosperous innovation performances within a country” (38). Furthermore, there is a considerable amount of focus on developing countries and the Caribbean region (39, 35, 26, 36, 29). The participants *strongly agree* that the “main priority in all types of developing countries is effective general technology policies, including improving basic education, building appropriate infrastructure, and reducing entry barriers for local firms that could be suppliers for MNEs” (39).

Table 11. Factor scores – Factor 1 top 10 most agreed statements

| N | D | Statement | Z-score | Grid Range |
|-----------|----------|---|----------------|-------------------|
| 38 | PP | It is important to consider all stakeholders in the (...) | 2.029 | +5 |
| 39 | STI | A main priority in all types of developing countries is (...) | 1.403 | +4 |
| 35 | PP | Developing countries should develop better ways to (...) | 1.207 | +4 |
| 26 | TD | A main weakness in the Caribbean is the disjuncture (...) | 1.119 | +3 |
| 36 | PP | For developing countries absorptive capacity is related (...) | 1.073 | +3 |
| 34 | PP | Effective innovation policy making will entail specific (...) | 0.994 | +3 |
| 10 | KE | The government should provide an intellectual property (...) | 0.966 | +2 |
| 33 | Q | Innovative activity means producing products and (...) | 0.792 | +2 |
| 29 | TD | Brain drain is caused by the reduction of opportunities (...) | 0.768 | +2 |
| 28 | TD | The way to stimulate talent development is to only (...) | 0.680 | +2 |

Table 12. Factor scores – Factor 1 top 10 most disagreed statements

| N | D | Statement | Z-score | Grid Range |
|-----------|----------|---|----------------|-------------------|
| 2 | CI | The Aruban creative industry should only include “art (...) | -2.875 | -5 |
| 3 | CI | The creative industries are just another member of the (...) | -2.055 | -4 |
| 7 | KE | The Aruban knowledge economy should only include (...) | -2.011 | -4 |
| 22 | SI | Innovation is more relevant to the private than the (...) | -1.997 | -3 |
| 5 | CI | The creative industries may not be well characterized as (...) | -1.180 | -3 |
| 21 | E | Entrepreneurs should solve societal and environmental (...) | -0.729 | -3 |
| 4 | CI | The creative industry is part of the entire growth model (...) | -0.688 | -2 |
| 18 | E | Entrepreneurs should solve environmental problem and (...) | -0.505 | -2 |
| 15 | S | The more advanced or mature a knowledge economy (...) | -0.477 | -2 |
| 37 | PP | The capacities of firms to introduce innovations in local (...) | -0.391 | -2 |

Also, that “developing countries should develop better ways to invest, monitor and evaluate the results of the R&D effort they fund in public laboratories, universities, and the productive sector” (35). The participants thereafter *agree* that in the Caribbean, there is a “discrepancy

between the labor market and the educational system” (26). Following with the thought that “absorptive capacity should revolve around assimilation of existing knowledge and technologies” (36). The Team Players also *moderately agree* that “brain drain is caused by the reduction of opportunities in the developing countries, next to the international labor market demand” (29). Additionally, they *agree* that effective innovation policy making will need specific attention of determining factors such as research, education, financing etc. (34). When it comes to the four different Quadruple Helix Innovation Models developed by Arnkil, Järvensivu, Koski and Piirainen in 2010, the teamplayers prefer the Citizen-centred Living Lab opposed to the Triple Helix +, Firm-centered Living Lab, or the Public sector-centered Living Lab (33). Lastly, on the topic of talent development, the team players *moderately agree* that “the way to stimulate talent development is to only provide loans for students going abroad when the subject they want to study is not being offered in home country and by making it obligatory for them to return after completion” (28). Thus, also representing their views on reciprocity and team loyalty.

Table 13. Factor 1 – Distinguishing Statements

| N | D | Statement | Q-sort | Z-score |
|-----------|----------|--|---------------|----------------|
| 38 | PP | It is important to consider all stakeholders in the innovation scheme of a country and to address their roles and contributions towards prosperous innovation performances within a country. | 5 | 2.03* |
| 35 | PP | Developing countries should develop better ways to invest, monitor and evaluate the results of the R&D effort they fund in public laboratories, universities, and the productive sector. | 4 | 1.21* |
| 36 | PP | For developing countries absorptive capacity is related to the assimilation of existing knowledge and technology to the ability to engage in advanced R&D and technological innovation activities. | 3 | 1.07 |
| 29 | TD | Brain drain is caused by the reduction of opportunities in the developing countries, next to the international labor market demand. | 2 | 0.77* |
| 28 | TD | The way to stimulate talent development is to only provide loans for students going abroad when the subject they want to study is not being offered in home country and by making it obligatory for them to return after completion. | 2 | 0.68* |
| 2 | CI | The Aruban creative industry should only include "art & music, graphic design, photography, web design, art studios and fashion". | -5 | -2.88* |

Note: * indicates significance at $P < 0.01$

Overall, besides the top agreed and disagreed statements displayed in Tables 11 and 12, according to the distinguishing statements, the focus according to the Team Players should be on reassuring inclusivity of all stakeholders; better investment, monitoring and evaluation of R&D; the assimilation of existing knowledge and technologies; creating labor opportunities; requiring loan receiving students to come back home after their studies; and to broaden the definitions of the Aruban creative industry and knowledge economy.

Factor 2: The Growth Seekers

Consisted with the results presented in Table 14, 15 and 16, the four participants that form the second perspective (i.e the Growth Seekers) also *disagree* with the definitions for the Aruban creative industry and knowledge economy (2 and 7). In their perception, just like the Team Players, they *disagree* that “innovation is more relevant to the private than the public sector” (22) and they *disagree* even more than the Team Players that “the capacities of firms to introduce innovations in local, national and international markets are a requirement for high-tech upgrading and improving the productive capacity of a country” (37).

Table 14. Factor scores – Factor 2 top 10 most agreed statements

| N | D | Statement | Z-score | Grid Range |
|----|----|--|---------|------------|
| 4 | CI | The creative industry is part of the entire growth model (...) | 2.008 | +5 |
| 10 | KE | The government should provide an intellectual property (...) | 1.819 | +4 |
| 1 | CI | The creative industry is perceived as an economic drain (...) | 1.501 | +4 |
| 8 | KE | If a country lacks a good knowledge economy base, it is (...) | 1.395 | +3 |
| 24 | SI | Creativity is considered a crucial factor for making (...) | 1.129 | +3 |
| 20 | E | Entrepreneurs should contribute to changing regulatory (...) | 1.069 | +3 |
| 13 | S | The creative sector should play an important role within (...) | 0.923 | +2 |
| 34 | PP | Effective innovation policy making will entail specific (...) | 0.896 | +2 |
| 15 | S | The more advanced or mature a knowledge economy (...) | 0.764 | +2 |
| 25 | SI | Social innovation could merge creative industries and (...) | 0.746 | +2 |

Table 15. Factor scores – Factor 2 top 10 most disagreed statements

| N | D | Statement | Z-score | Grid Range |
|----|----|---|---------|------------|
| 2 | CI | The Aruban creative industry should only include “art (...) | -1.803 | -5 |
| 22 | SI | Innovation is more relevant to the private than the (...) | -1.801 | -4 |
| 3 | CI | The creative industries are just another member of the (...) | -1.716 | -4 |
| 37 | PP | The capacities of firms to introduce innovations in local (...) | -1.503 | -3 |
| 7 | KE | The Aruban knowledge economy should only include (...) | -1.453 | -3 |
| 28 | TD | The way to stimulate talent development is to only (...) | -1.374 | -3 |
| 30 | Q | Innovation activity means producing commercially (...) | -0.877 | -2 |
| 33 | Q | Innovative activity means producing products and (...) | -0.762 | -2 |
| 29 | TD | Brain drain is caused by the reduction of opportunities (...) | -0.757 | -2 |
| 35 | PP | Developing countries should develop better ways to (...) | -0.722 | -2 |

Furthermore, even though the Team Players *agree* that “the way to stimulate talent development is to only provide loans for students going abroad when the subject they want to study is not being offered in home country and by making it obligatory for them to return after completion” (28), that “brain drain is caused by the reduction of opportunities in the developing countries, next to the international labor market demand”, and that “developing countries should develop better ways to invest, monitor and evaluate the results of the R&D effort they fund in public

laboratories, universities, and the productive sector.” (35), the Growth Seekers *completely disagree* with all of these statements. Other factors of disagreement include that they *strongly disagree* that the Aruban creative industry should be based on the competition model (3), however, they *extremely agree* that it should be based on the growth model (4), resulting in the categorization of these as “the Growth Seekers”. However, even though the Growth Seekers prefer the growth model for the creative industries, they do feel that “the creative industry is as an economic drain, due to the production of activities/products of high cultural value, but at the same time low market value” (1) and confirm this feeling by agreeing that “the creative sector could play an important role within the knowledge-economy but this depends on the adaptation to the “big three” (digitization, convergence and globalization) fostered by the state itself” (13). As Growth Seekers, they also feel that “if a country lacks a good knowledge base, it is likely to have poor governance, which in turn will steer capital away (8). Even though the Growth Seekers are not fans of the creative industry, they do agree that “creativity is considered a crucial factor for making social innovation happen, where creativity can be seen as the human ability to produce new things, or create new situations, rather than the innovative use of available resources and/or of known technologies” (24) and that “social innovation could merge creative industries and knowledge economies, considering that creativity and knowledge can simply not be separated from each other” (25).

Table 16. Factor 2 – Distinguishing Statements

| N | D | Statement | Q-sort | Z-score |
|----------|----------|---|---------------|----------------|
| 4 | CI | The creative industry is part of the entire growth model of the economy through supply and demand. | 5 | 2.01* |
| 10 | KE | The Government should provide an intellectual property vision and leadership. | 4 | 1.82* |
| 5 | CI | The creative industries may not be well characterized as an industry per se, but rather as an element of the innovation system. | 1 | 0.29 |
| 33 | Q | Innovative activity means producing products and services relevant for citizens. | -2 | -0.76* |
| 37 | PP | The capacities of firms to introduce innovations in local, national and international markets are a requirement for high-tech upgrading and improving the productive capacity of a country. | -3 | -1.50 |

Note: * indicates significance at $P < 0.01$

When it comes to the four different Quadruple Helix Innovation Models developed by Arnkil, Järvensivu, Koski and Piirainen in 2010, the Growth Seekers don’t specifically indicate their preference, but they just indicate that they oppose the Triple Helix + model and the Citizen-centered Living Lab compared to the Firm-centered Living Lab and Public sector-centered Living Lab (30 and 33), thus confirming their attention to economic growth instead of inclusive or human-centered growth. Also, unlike the Team Players, they *agree* with the concept of institutional

entrepreneurship, where entrepreneurs contribute to changing regulatory, societal and market institutions (20), and unlike the Team Players, they *agree* with the notion that “the more advanced or mature a knowledge economy or knowledge society is, the more or the better a surplus of knowledge, innovation, or creativity can be absorbed and transformed into sustainable development” (15). The Growth Seekers similarly to the Team Players, *moderately agree* that “effective innovation policy making will entail specific attention on research, education, trade and industry development, financing and other determining factors” (34), all growth enhancing policy methods.

Overall, besides the top agreed and disagreed statements listed in Tables 14 and 15, according to the distinguishing statements the focus in the eyes of to the Growth Seekers should be on applying the growth model for the creative industry; strong attention on intellectual property rights; considering the creative industry as an innovation system; considering the Firm-centered Living Lab QHIM and/or the Public sector-centered Living Lab; considering enhancing firm-based innovation capacity in local, national and international markets.

Factor 3: The Neutralists

Consistent with the results presented in Tables 17, 19 and 20, the 11 participants that form the third perspective (the Neutralists) along side the earlier defined Team Players and Growth Seekers, also have a strong opposition to the definition of the Aruban creative industry and knowledge economy (2 and 7). Here, the participants do not feel that the creative industry is “an economic drain, due to the production of activities/products of high cultural value, but at the same time low market value” (1). However, compared to the Growth Seekers, here the participants *disagree* with the creative industries being an element of the innovation system instead of an industry. Also, they *disagree* that the Aruban creative industry should be based on the competition model (3), thus preferring other models.

Table 17. Factor scores – Factor 3 top 10 most agreed statements

| N | D | Statement | Z-score | Grid Range |
|----|----|---|---------|------------|
| 8 | KE | If a country lacks a good knowledge economy base, it is (...) | 1.592 | +5 |
| 9 | KE | Within the knowledge economy firms are compelled to (...) | 1.461 | +4 |
| 23 | SI | Harnessing innovation for sustainable and inclusive (...) | 1.271 | +4 |
| 24 | SI | Creativity is considered a crucial factor for making (...) | 1.205 | +3 |
| 12 | S | An advanced knowledge economy is a knowledge (...) | 1.132 | +3 |
| 14 | S | Considering the pressure SIDSs endure to remain (...) | 0.928 | +3 |
| 27 | TD | Economic value and competitive differentiation of the (...) | 0.823 | +2 |
| 34 | PP | Effective innovation policy making will entail specific (...) | 0.787 | +2 |
| 38 | PP | It is important to consider all stakeholders in the (...) | 0.657 | +2 |
| 15 | S | The more advanced or mature a knowledge economy (...) | 0.637 | +2 |

Table 18. Factor Q-sort Values for each statement per discourse

| N | D | Statement | Factor 1 | | Factor 2 | | Factor 3 | | Factor 4 | | Factor 5 | |
|----|----|--|-----------|---------------|----------|--------------|-----------|---------------|----------|---------------|-----------|---------------|
| | | | Q-Sort | Z-score | Q-Sort | Z-score | Q-Sort | Z-score | Q-sort | Z-score | Q-sort | Z-score |
| 1 | CI | The creative industry is perceived as an economic drain (...) | -1 | -0.390 | 4 | 1.501 | -4 | -1.978 | -3 | -1.012 | 3 | 1.164 |
| 2 | CI | The Aruban creative industry should only include “art (...) | -5 | -2.875 | -5 | -1.803 | -3 | -1.826 | 1 | 0.663 | 0 | -0.110 |
| 3 | CI | The creative industries are just another member of the (...) | -4 | -2.055 | -4 | -1.716 | -2 | -0.617 | 0 | -0.140 | 1 | 0.570 |
| 4 | CI | The creative industry is part of the entire growth model (...) | -2 | -0.688 | 5 | 2.008 | 0 | 0.311 | -1 | -0.454 | 2 | 0.705 |
| 5 | CI | The creative industries may not be well characterized as (...) | -3 | -1.180 | 1 | 0.289 | -2 | -0.831 | -1 | -0.663 | -2 | -0.760 |
| 6 | KE | The intention of the knowledge economy should be to (...) | 1 | 0.493 | 0 | -0.092 | 0 | -0.045 | 5 | 2.791 | 1 | 0.649 |
| 7 | KE | The Aruban knowledge economy should only include (...) | -4 | -2.011 | -3 | -1.453 | -5 | -2.156 | 3 | 1.099 | -4 | -2.193 |
| 8 | KE | If a country lacks a good knowledge economy base, it is (...) | 0 | -0.029 | 3 | 1.395 | 5 | 1.592 | 0 | -0.209 | 1 | 0.649 |
| 9 | KE | Within the knowledge economy firms are compelled to (...) | 0 | 0.133 | 1 | 0.698 | 4 | 1.461 | -2 | -0.768 | 2 | 0.760 |
| 10 | KE | The government should provide an intellectual property (...) | 2 | 0.966 | 4 | 1.819 | 1 | 0.313 | -1 | -0.331 | 2 | 0.705 |
| 11 | S | In order for a policy synergy between the creative (...) | -1 | -0.383 | 1 | 0.746 | -2 | -0.639 | 0 | 0.105 | -2 | -0.894 |
| 12 | S | An advanced knowledge economy is a knowledge (...) | 1 | 0.313 | 1 | 0.388 | 3 | 1.205 | 1 | 0.349 | 0 | -0.135 |
| 13 | S | The creative sector should play an important role within (...) | -1 | -0.318 | 2 | 1.063 | -2 | -0.458 | 1 | 0.454 | -1 | -0.705 |
| 14 | S | Considering the pressure SIDSs endure to remain (...) | -1 | -0.271 | 0 | -0.075 | 3 | 1.132 | -1 | -0.454 | 3 | 1.274 |
| 15 | S | The more advanced or mature a knowledge economy (...) | -2 | -0.477 | 2 | 0.869 | 2 | 0.657 | -1 | -0.558 | 0 | 0.325 |
| 16 | SD | The biggest challenge for the Caribbean is not only that (...) | 1 | 0.478 | 1 | 0.594 | 1 | 0.581 | 4 | 2.233 | -5 | -2.248 |
| 17 | SD | Aruba should become a living lab for innovative island (...) | 0 | 0.222 | 0 | 0.001 | 1 | 0.637 | 3 | 1.221 | 0 | 0.190 |
| 18 | E | Entrepreneurs should solve environmental problem and (...) | -2 | -0.505 | -1 | -0.612 | -1 | -0.238 | -2 | -0.768 | -1 | -0.570 |
| 19 | E | Entrepreneurs should solve societal problems and (...) | 1 | 0.303 | 0 | -0.147 | 0 | -0.066 | 2 | 0.907 | -1 | -0.515 |

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| | | | | | | | | | | | | |
|----|-----|---|----------|--------------|-----------|---------------|-----------|---------------|-----------|---------------|----------|--------------|
| 20 | E | Entrepreneurs should contribute to changing regulatory (...) | -1 | -0.237 | 3 | 1.069 | 0 | 0.049 | -3 | -0.994 | 1 | 0.570 |
| 21 | E | Entrepreneurs should solve societal and environmental (...) | -3 | -0.729 | -1 | -0.513 | 0 | 0.123 | 0 | -0.209 | -1 | -0.594 |
| 22 | SI | Innovation is more relevant to the private than the (...) | -3 | -1.997 | -4 | -1.801 | -3 | -1.937 | -2 | -0.907 | 4 | -1.679 |
| 23 | SI | Harnessing innovation for sustainable and inclusive (...) | 0 | 0.107 | -1 | -0.473 | 4 | 1.416 | 0 | 0.000 | -1 | -0.705 |
| 24 | SI | Creativity is considered a crucial factor for making (...) | 1 | 0.408 | 3 | 1.129 | 3 | 1.271 | -2 | -0.785 | 0 | 0.325 |
| 25 | SI | Social innovation could merge creative industries and (...) | -1 | -0.165 | 2 | 0.764 | 1 | 0.335 | 2 | 0.768 | 1 | 0.459 |
| 26 | TD | A main weakness in the Caribbean is the disjuncture (...) | 3 | 1.119 | 1 | 0.565 | -1 | -0.381 | 4 | 1.343 | -3 | -1.029 |
| 27 | TD | Economic value and competitive differentiation of the (...) | 1 | 0.538 | -1 | -0.481 | 2 | 0.928 | 0 | -0.277 | 2 | 0.974 |
| 28 | TD | The way to stimulate talent development is to only (...) | 2 | 0.680 | -3 | -1.374 | -4 | -2.066 | -1 | -0.576 | -2 | -0.839 |
| 29 | TD | Brain drain is caused by the reduction of opportunities (...) | 2 | 0.768 | -2 | -0.757 | -1 | -0.189 | -5 | -2.111 | -3 | -1.164 |
| 30 | Q | Innovation activity means producing commercially (...) | 0 | 0.033 | -2 | -0.877 | -3 | -1.282 | 2 | 0.785 | 5 | 1.869 |
| 31 | Q | Innovative activity means producing goods and services (...) | 0 | 0.301 | 0 | 0.048 | -1 | -0.400 | -3 | -1.099 | -2 | -0.839 |
| 32 | Q | Innovative activity means producing products and (...) | 0 | 0.168 | 0 | 0.223 | -1 | -0.165 | 1 | 0.558 | 4 | 1.679 |
| 33 | Q | Innovative activity means producing products and (...) | 2 | 0.792 | -2 | -0.762 | 1 | 0.351 | 3 | 1.012 | 3 | 1.164 |
| 34 | Q | Effective innovation policy making will entail specific (...) | 3 | 0.994 | 2 | 0.923 | 2 | 0.823 | 1 | 0.331 | -1 | -0.325 |
| 35 | PP | Developing countries should develop better ways to (...) | 4 | 1.207 | -2 | -0.722 | 0 | 0.307 | -4 | -1.553 | -3 | -0.974 |
| 36 | PP | For developing countries absorptive capacity is related (...) | 3 | 1.073 | -1 | -0.433 | 0 | 0.292 | 1 | 0.209 | 0 | 0.190 |
| 37 | PP | The capacities of firms to introduce innovations in local (...) | -2 | -0.391 | -3 | -1.503 | -1 | -0.084 | -1 | -0.680 | 0 | -0.190 |
| 38 | PP | It is important to consider all stakeholders in the (...) | 5 | 2.029 | 0 | -0.298 | 2 | 0.787 | -4 | -1.343 | 0 | 0.110 |
| 39 | STI | A main priority in all types of developing countries is (...) | 4 | 1.403 | 0 | 0.175 | 1 | 0.514 | 2 | 0.890 | 4 | 1.623 |
| 40 | STI | Constructing strategic links and coordination between (...) | 0 | 0.175 | -1 | -0.375 | 0 | 0.273 | 0 | 0.000 | 1 | 0.515 |

Note: Discourse – CI: creative industries, KE: knowledge economy, S: Synergy, E: Entrepreneurship, SI: Social Innovation, TD: Talent Development, SD: SIDS, Q: QHIM, PP: Public Policy, STI: Science, Technology and Innovation; Bold Z-score values indicate a distinguishing statement

Table 19. Factor scores – Factor 3 top 10 most disagreed statements

| N | D | Statement | Z-score | Grid Range |
|-----------|----------|--|----------------|-------------------|
| 7 | KE | The Aruban knowledge economy should only include (...) | -2.156 | -5 |
| 28 | TD | The way to stimulate talent development is to only (...) | -2.066 | -4 |
| 1 | CI | The creative industry is perceived as an economic drain (...) | -1.978 | -4 |
| 22 | SI | Innovation is more relevant to the private than the (...) | -1.826 | -3 |
| 2 | CI | The Aruban creative industry should only include “art (...) | -1.282 | -3 |
| 30 | Q | Innovation activity means producing commercially (...) | -0.831 | -3 |
| 5 | CI | The creative industries may not be well characterized as (...) | -0.639 | -2 |
| 11 | S | In order for a policy synergy between the creative (...) | -0.617 | -2 |
| 3 | CI | The creative industries are just another member of the (...) | -0.458 | -2 |
| 13 | S | The creative sector should play an important role within (...) | -0.400 | -2 |

Relating to the synergy between the two economies, while these participants *agree* that “an advanced knowledge economy is a knowledge economy, innovation economy, and a creativity economy at the same time” (12), and that “the use of knowledge and the incorporation of creativity is now inevitable considering the vector of growth across all sectors of the economy and to attract business opportunities, investment and a highly skilled workforce” (14), and that “the more advanced or mature a knowledge economy or knowledge society is, the more or the better a surplus of knowledge, innovation, or creativity can be absorbed and transformed into sustainable development” (15), they *moderately disagree* that “in order for a policy synergy between the creative industry and knowledge economy to be feasible, the creative industry should operate within the innovation model” (11) and that “the creative sector could play an important role within the knowledge-economy but this depends on the adaptation to the “big three” (digitization, convergence and globalization) fostered by the state itself” (13). This indicates that the viewpoint of these participants is somewhat neutral. When it comes to the four different Quadruple Helix Innovation Models developed by Arnkil, Järvensivu, Koski and Piirainen in 2010, the Neutralists indicate that they oppose the Triple Helix + model compared to the Citizen-centered Living Lab, the Firm-centered Living Lab and Public sector-centered Living Lab (30), thus confirming their attention to both economic growth and inclusive or human-centered growth. Also, same as the Team Players and Growth Seekers, the Neutralists *disagree* with “innovation is more relevant to the private than the public sector” (22). Now, regarding the knowledge economy, the Neutralists *extremely agree* on the fact that “if a country lacks a good knowledge base, it is likely to have poor governance, which in turn will steer capital away” (8) and *strongly agree* that “within the knowledge economy firms are compelled to develop a creative, innovative capacity that can generate new ideas, solutions and products” (9).

When it comes to the topic of social innovation, the neutralists *strongly agree* that “harnessing innovation for sustainable and inclusive development requires changes in the direction of key

economic and social processes which cannot take place without the strong involvement of civil society” (23) and *agree* that “creativity is considered a crucial factor for making social innovation happen, where creativity can be seen as the human ability to produce new things, or create new situations, rather than the innovative use of available resources and/or of known technologies” (24). Regarding the topic of talent development, “economic value and competitive differentiation of cities will increasingly be derived from people and their skills, creativity and knowledge, as well as the capacity of the economy to create and absorb innovation” (27).

Table 20. Factor 3 – Distinguishing Statements

| N | D | Statement | Q-sort | Z-score |
|----------|----------|--|---------------|----------------|
| 23 | SI | Harnessing innovation for sustainable and inclusive development requires changes in the direction of key economic and social processes which cannot take place without the strong involvement of civil society. | 4 | 1.42* |
| 12 | S | An advanced knowledge economy is a knowledge economy, innovation economy, and a creativity economy at the same time. | 3 | 1.20 |
| 35 | PP | Developing countries should develop better ways to invest, monitor and evaluate the results of the R&D effort they fund in public laboratories, universities, and the productive sector. | 0 | 0.31* |
| 29 | TD | Brain drain is caused by the reduction of opportunities in the developing countries, next to the international labor market demand. | -1 | -0.19 |
| 1 | CI | The creative industry is perceived as an economic drain, due to the production of activities/products of high cultural value, but at the same time low market value. | -4 | -1.98* |
| 28 | TD | The way to stimulate talent development is to only provide loans for students going abroad when the subject they want to study is not being offered in home country and by making it obligatory for them to return after completion. | -4 | -2.07 |

Note: * indicates significance at $P < 0.01$

Lastly, on the topic of public policy, “effective innovation policy making will entail specific attention on research, education, trade and industry development, financing and other determining factors” and “it is important to consider all stakeholders in the innovation scheme of a country and to address their roles and contributions towards prosperous innovation performances within a country” (38). Overall, besides the top agreed and disagreed statements, according to the distinguishing statements, the focus in the eyes of the Neutralists should be on the involvement of the civil society; developing a knowledge economy, innovation economy, and a creativity economy at the same time; better investment, monitoring and evaluation of R&D; finding other causes for the Aruban brain drain; supporting the creative industry; providing students with support but not by obligating them to reciprocate and come back to Aruba.

Factor 4: The Innovation Enthusiast and the Innovation Sceptic

Given the bipolar nature of factor four, participants that load into this factor value similar statements, yet in mirror-form. This perspective is defined by a strong opinion on the intention

of the knowledge economy (6) and the reason behind brain drain (29). Consistent with the results presented in Tables 21, 22 and 23, perspective 4a is termed “technology adopters and knowledge exporters, with a strong conviction that brain drain is not caused by a reduction of labor opportunities”, or the Innovation Enthusiast” (1 participant), while perspective 4b is termed “technology adopter and knowledge export sceptic, with a strong conviction that brain drain is indeed caused by a reduction of labor opportunities”, or the “Innovation Sceptic” (1 participant). The Q-sort values and Z-scores represent perspective 4a, thus, the opposite values hold true for perspective 4b. As a side note, the participant that loaded positively (Innovation Enthusiast, 4a) into factor 4 was created by a person representing the private sector, while the negatively (Innovation Sceptic, 4b) loaded.

The Innovation Enthusiast, like the Team Players *extremely disagrees* with the statement that “brain drain is caused by the reduction of opportunities in the developing countries, next to the international labor market demand” (29), these participants *extremely disagree*, while the Innovation Sceptic only *disagrees*. On the topic of public policy, the Innovation Sceptic believes that “developing countries should develop better ways to invest, monitor and evaluate the results of the R&D effort they fund in public laboratories, universities, and the productive sector” (35) and that “it is important to consider all stakeholders in the innovation scheme of a country and to address their roles and contributions towards prosperous innovation performances within a country” (38), while the Innovation Enthusiast *strongly disagree*. The Innovation Sceptic believes that “the creative industry is perceived as an economic drain, due to the production of activities/products of high cultural value, but at the same time low market value” (1), unlike the Innovation Enthusiast and the Growth Seekers. Also, like many of the groups regarding social innovation, the Innovation Enthusiast also feel that innovation is not “more relevant to the private than the public sector” (22) and *slightly disagree* that “creativity is considered a crucial factor for making social innovation happen, where creativity can be seen as the human ability to produce new things, or create new situations, rather than the innovative use of available resources and/or of known technologies” (24). However, they do *agree* that “social innovation could merge creative industries and knowledge economies, considering that creativity and knowledge can simply not be separated from each other” (25). While, the sceptic side of this factor (perspective 4b) does not see this. When it comes to the four different Quadruple Helix Innovation Models developed by Arnkil, Järvensivu, Koski and Piirainen in 2010, the “technology adopter and knowledge exporter” indicate that they oppose the Firm-centered Living Lab and agree with the Triple Helix + model and the Citizen-centered Living Lab (30, 31 and 33). However, the Innovation Sceptic *agrees* with the Firm-centered Living Lab and oppose the

Triple Helix+ and the Citizen-centered Living Lab. Also, unlike the Growth Seekers, the Innovation Enthusiast *disagrees* with the concept of institutional entrepreneurship, where entrepreneurs contribute to changing regulatory, societal and market institutions (20) and *moderately disagree* with the concept of ecopreneurship (18), but *moderately agree* with the concept of social entrepreneurship (19), while the Innovation Sceptic feel the opposite.

Table 21. Factor scores – Factor 4 top 10 most agreed statements

| N | D | Statement | Z-score | Grid Range |
|----|-----|--|---------|------------|
| 6 | KE | The intention of the knowledge economy should be to (...) | 2.791 | +5 |
| 16 | SD | The biggest challenge for the Caribbean is not only that (...) | 2.233 | +4 |
| 26 | TD | A main weakness in the Caribbean is the disjuncture (...) | 1.343 | +4 |
| 17 | SD | Aruba should become a living lab for innovative island (...) | 1.211 | +3 |
| 7 | KE | The Aruban knowledge economy should only include (...) | 1.099 | +3 |
| 33 | Q | Innovative activity means producing products and (...) | 0.907 | +3 |
| 19 | E | Entrepreneurs should solve societal problems and (...) | 0.890 | +2 |
| 39 | STI | A main priority in all types of developing countries is (...) | 0.785 | +2 |
| 30 | Q | Innovation activity means producing commercially (...) | 0.768 | +2 |
| 25 | SI | Social innovation could merge creative industries and (...) | 0.663 | +2 |

Table 22. Factor scores – Factor 4 top 10 most disagreed statements

| N | D | Statement | Z-score | Grid Range |
|----|----|---|---------|------------|
| 29 | TD | Brain drain is caused by the reduction of opportunities (...) | -2.111 | -5 |
| 35 | PP | Developing countries should develop better ways to (...) | -1.553 | -4 |
| 38 | PP | It is important to consider all stakeholders in the (...) | -1.343 | -4 |
| 31 | Q | Innovative activity means producing goods and services (...) | -1.099 | -3 |
| 1 | CI | The creative industry is perceived as an economic drain (...) | -1.012 | -3 |
| 20 | E | Entrepreneurs should contribute to changing regulatory (...) | -0.994 | -3 |
| 22 | SI | Innovation is more relevant to the private than the (...) | -0.907 | -2 |
| 24 | SI | Creativity is considered a crucial factor for making (...) | -0.785 | -2 |
| 9 | KE | Within the knowledge economy firms are compelled to (...) | -0.768 | -2 |
| 18 | E | Entrepreneurs should solve environmental problem and (...) | -0.768 | -2 |

Most distinctive for the Innovation Enthusiast is that they do *agree* with the current definition of the knowledge economy for Aruba, which indicates that it “should only include solar energy, ocean technology & cooling, higher education & export, and ICT island based solutions efficiency and innovation for export” (7), while they *extremely agree* that “the intention of the knowledge economy should be to develop new technologies, adopt them locally to tackle local challenges on the island and to showcase these solutions as export services” (6). However, this is not the case for the Innovation Sceptic. The Innovation Enthusiast strongly believes that when it comes to SIDS, “the biggest challenge for the Caribbean is not only that islands lack capacity, because that can be remedied with proper policy measures, but that policy makers have no clue how to transform best practices from developed countries into the local innovation context for

island states” (16) and that “Aruba should become a living lab for innovative island solutions for the Caribbean” (17). While, for the Innovation Sceptic, this is not the case. Related to talent development, specifically regarding labor opportunities besides brain drain, the Innovation Enthusiast believes that “a main weakness in the Caribbean is the disjuncture between the educational system and the labor market, impeding realization of the full potential of both women and men” (26), while the Innovation Sceptic does not believe this. Lastly, regarding STI policy, Innovation Enthusiast *moderately agrees* that “a main priority in all types of developing countries is effective general technology policies, including improving basic education, building appropriate infrastructure, and reducing entry barriers for local firms that could be suppliers for MNEs” (39), while the Innovation Sceptic *disagrees*.

Table 23. Factor 4 – Distinguishing Statements

| N | D | Statement | Q-sort | Z-score |
|----------|----------|---|---------------|----------------|
| 6 | KE | The intention of the knowledge economy should be to develop new technologies, adopt them locally to tackle local challenges on the island and to showcase these solutions as export services. | 5 | 2.79* |
| 16 | SD | The biggest challenge for the Caribbean is not only that islands lack capacity, because that can be remedied with proper policy measures, but that policy makers have no clue how to transform best practices from developed countries into the local innovation context for island states. | 4 | 2.23* |
| 7 | KE | The Aruban knowledge economy should only include solar energy, ocean technology & cooling, higher education & export, and ICT island based solutions efficiency and innovation for export. | 3 | 1.10* |
| 9 | KE | Within the knowledge economy firms are compelled to develop a creative, innovative capacity that can generate new ideas, solutions and products. | -2 | -0.77 |
| 24 | SI | Creativity is considered a crucial factor for making social innovation happen, where creativity can be seen as the human ability to produce new things, or create new situations, rather than the innovative use of available resources and/or of known technologies. | -2 | -0.78 |
| 38 | PP | It is important to consider all stakeholders in the innovation scheme of a country and to address their roles and contributions towards prosperous innovation performances within a country. | -4 | -1.34 |
| 29 | TD | Brain drain is caused by the reduction of opportunities in the developing countries, next to the international labor market demand. | -5 | -2.11 |

Note: * indicates significance at $P < 0.01$

Overall, besides the top agreed and disagreed statements illustrated in Tables 22 and 23, according to the distinguishing statements the focus in the eye of the Innovation Enthusiast (private sector), should be on developing new technologies, adopt them locally to tackle local challenges on the island and to showcase these solutions as export services; having policy makers that know how to transform best practices from developed countries into the local innovation context for island states; including only solar energy, ocean technology & cooling, higher education & export, and ICT island based solutions efficiency and innovation for export; helping

firms develop a creative, innovative capacity that can generate new ideas, solutions and products; finding other factors besides creativity for making social innovation happen; considering less stakeholders in the innovation scheme of Aruba and to address their roles and contributions towards prosperous innovation performances within Aruba; and lastly, finding other causes for the Aruban brain drain.

However, according to the distinguishing statements the focus in the eye of the innovation sceptic (policy maker, public sector), should be on creating more labor opportunities locally; considering all stakeholders in the innovation scheme of Aruba and addressing their roles and contributions towards prosperous innovation performances within Aruba; using creativity for making social innovation happen; helping firms develop a creative, innovative capacity that can generate new ideas, solutions and products; finding other factors besides creativity for making social innovation happen; not only including solar energy, ocean technology & cooling, higher education & export, and ICT island based solutions efficiency and innovation for export; continuing the work of current policy makers; and lastly, finding other ways besides developing new technologies, adopting them locally to tackle local challenges on the island and to showcase these solutions as export services.

Factor 5: The Innovators

Consistent with the results presented in Tables 24, 25 and 26, the two participants that form the fifth perspective (the Innovators) like some of the other groups *strongly disagree* with the definition of the knowledge economy in Aruba, which states that it should “only include Solar Energy, Ocean Technology & Cooling, Higher education & Export, and ICT island based solutions efficiency and innovation for export” (7) and *moderately disagrees* with the “creative industries being an element of the innovation system” but considers it more as an industry (5). When it comes to the four different Quadruple Helix Innovation Models developed by Arnkil, Järvensivu, Koski and Piirainen in 2010, the Innovators indicate that they *extremely agree* the Triple Helix + model and the Firm-centered Living Lab, and *agree* with the Public sector-centered Living Lab, while they agree with the Citizen-centered Living Lab and moderately disagree with Firm-centered Living Lab (30, 33, 32 and 33). This reaffirms their impressive attention for innovation and is why they are considered to be the Innovators between all the groups. The Innovators *extremely disagree* with the notion that the “that policy makers have no clue how to transform best practices from developed countries into the local innovation context for island states” and also *strongly disagrees* that “innovation is more relevant to the private than the public sector” (22). Related to the topic of talent development, especially on labor opportunities, the Innovators *disagree* that “brain drain is caused by the reduction of opportunities in the developing

countries, next to the international labor market demand” (29), that “a main weakness in the Caribbean is the disjuncture between the educational system and the labor market, impeding realization of the full potential of both women and men” (26) and that “the way to stimulate talent development is to only provide loans for students going abroad when the subject they want to study is not being offered in home country and by making it obligatory for them to return after completion” (28).

Table 24. Factor scores – Factor 5 top 10 most agreed statements

| N | D | Statement | Z-score | Grid Range |
|----|-----|--|---------|------------|
| 30 | Q | Innovation activity means producing commercially (...) | 1.869 | +5 |
| 32 | Q | Innovative activity means producing products and (...) | 1.679 | +4 |
| 39 | STI | A main priority in all types of developing countries is (...) | 1.623 | +4 |
| 14 | S | Considering the pressure SIDSs endure to remain (...) | 1.274 | +3 |
| 1 | CI | The creative industry is perceived as an economic drain (...) | 1.164 | +3 |
| 33 | Q | Innovative activity means producing products and (...) | 1.164 | +3 |
| 27 | TD | Economic value and competitive differentiation of the (...) | 0.974 | +2 |
| 9 | KE | Within the knowledge economy firms are compelled to (...) | 0.760 | +2 |
| 10 | KE | The government should provide an intellectual property (...) | 0.705 | +2 |
| 4 | CI | The creative industry is part of the entire growth model (...) | 0.705 | +2 |

Table 25. Factor scores – Factor 5 top 10 most disagreed statements

| N | D | Statement | Z-score | Grid Range |
|----|----|--|---------|------------|
| 16 | SD | The biggest challenge for the Caribbean is not only that (...) | -2.248 | -5 |
| 7 | KE | The Aruban knowledge economy should only include (...) | -2.193 | -4 |
| 22 | SI | Innovation is more relevant to the private than the (...) | -1.679 | -4 |
| 29 | TD | Brain drain is caused by the reduction of opportunities (...) | -1.164 | -3 |
| 26 | TD | A main weakness in the Caribbean is the disjuncture (...) | -1.029 | -3 |
| 35 | PP | Developing countries should develop better ways to (...) | -1.974 | -3 |
| 11 | S | In order for a policy synergy between the creative (...) | -0.894 | -2 |
| 28 | TD | The way to stimulate talent development is to only (...) | -0.839 | -2 |
| 31 | Q | Innovative activity means producing goods and services (...) | -0.839 | -2 |
| 5 | CI | The creative industries may not be well characterized as (...) | -0.760 | -2 |

Also, the Innovators *moderately disagree* that “in order for a policy synergy between the creative industry and knowledge economy to be feasible, the creative industry should operate within the innovation model” (11), however, they *agree* that “considering the pressure SIDSs endure to remain competitive and resilient to external shocks. The use of knowledge and the incorporation of creativity is now inevitable considering the vector of growth across all sectors of the economy and to attract business opportunities, investment and a highly skilled workforce” (14). While, on matters of public policy, the Innovators *disagree* that “developing countries should develop better ways to invest, monitor and evaluate the results of the R&D effort they fund in public laboratories, universities, and the productive sector” (35). However, they *strongly agree* that “a main

priority in all types of developing countries is effective general technology policies, including improving basic education, building appropriate infrastructure, and reducing entry barriers for local firms that could be suppliers for MNEs” (39). Related to the creative industries, the Innovators *agree* that the creative industry is “perceived as an economic drain, due to the production of activities/products of high cultural value, but at the same time low market value” (1) and but *moderately agree* that the creative industry is “part of the entire growth model of the economy through supply and demand” (4) just like the Growth Seekers. Now, regarding the knowledge economy the Innovators *moderately agree* that “within the knowledge economy firms are compelled to develop a creative, innovative capacity that can generate new ideas, solutions and products” (9) and that “the government should provide an intellectual property vision and leadership” (10). Lastly, related to talent development, the Innovators *moderately agree* that the “economic value and competitive differentiation of cities will increasingly be derived from people and their skills, creativity and knowledge, as well as the capacity of the economy to create and absorb innovation” (27). Overall, besides the top agreed and disagreed statements as shown in Tables 25 and 26, according to the distinguishing statements the focus in the eyes of the Innovators should be on the Triple Helix + model and Public sector-centered Living Lab; and lastly, continuing the work of current policy makers.

Table 26. Factor 5 – Distinguishing Statements

| N | D | Statement | Q-sort | Z-score |
|----------|----------|---|---------------|----------------|
| 30 | Q | Innovation activity means producing commercially successful high tech products and goods. | 5 | 1.87 |
| 32 | Q | Innovative activity means producing products and services relevant for public authorities and the users of the public services. | 4 | 1.68 |
| 16 | SD | The biggest challenge for the Caribbean is not only that islands lack capacity, because that can be remedied with proper policy measures, but that policy makers have no clue how to transform best practices from developed countries into the local innovation context for island states. | -5 | -2.25* |

Note: * indicates significance at $P < 0.01$

Areas of Consensus Among all Perspectives

Besides the differences between the five perspectives, there are not many consensus statements between the various factors. In general, all factors maintain a slightly negative view on ecopreneurship compared to other possible types. In this case entrepreneurs are expected to solve environmental problem and creative economic value. Aside from this, most groups have a neutral view on constructing strategic links and coordination between STI policy, and that other development policies (industrial policy, FDI, trade, competition, education and training, entrepreneurship and SME policies) is crucial to solidifying the improvement potential of

innovation. Since most of the consensus statements presented here have relatively weak Q-sort values, the discussion in chapter 9 seeks for additional, stronger, generally agreed upon statements between all groups within the idealized Q-sorts.

Table 27. Consensus Statements by Sort per Factor

| N | D | Statement | Q-SV | Q-SV | Q-SV | Q-SV | Q-SV |
|-----------|----------|--|-------------|-------------|-------------|-------------|-------------|
| | | | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
| 18 | E | Entrepreneurs should solve environmental problem and creative economic value. | -2 | -1 | -1 | -2 | -1 |
| 40 | STI | Constructing strategic links and coordination between STI policy and other development policies is crucial to solidifying the improvement potential of innovation. | 0 | -1 | 0 | 0 | 1 |

9. Discussion

The main reason for applying the Q-methodology has been to gain a better understanding of the different stakeholder perspectives in Aruba regarding the possibility of policy-wise merging the creative industry and knowledge economy. Following the results presented in the previous chapter, in this chapter will delve into a discussion of the results from the analysis and aims to answer the sub-questions of this research. The first section of this chapter will discuss sub-research questions 1a and 1b and with a focus on the stakeholder subjectivity, while the second section of this chapter discusses sub-research question 2 and will focus on policy recommendations.

9.1 Stakeholder Subjectivity

The first research sub-question was related to finding out the actual perspectives of the 4 representative stakeholder groups (public sector, private sector, academia, and NGOs and community). As a refresher, research sub-questions 1a and 1b are as follows:

- 1a. How do the stakeholders position themselves in the synergy of a creative economy and knowledge economy through innovation?
- 1b. How do the stakeholders position themselves regarding the Quadruple Helix Innovation Model and the remaining socio-economic development factors through innovation?

As the results in the previous chapter have shown, five distinctive perspectives were identified, where Factor 4 as a bipolar perspective, was divided into two, ultimately resulting in six perspectives. These perspectives are categorized as the (1) the Team Players, (2) the Growth Seekers, (3) the Neutralists, (4a) the Innovation Enthusiast, (4b) the Innovation Sceptic, and lastly, (5) the Innovators. As seen in Table 18, when it comes to the synergy of the two economies, there are five different statements in the Q-sample that were representative. The first observation is that overall, none of the groups had strong convictions on the possible synergy between the two economies, confirming that the stakeholders are currently not ready to have strong agreeing or opposing opinions. This might be because these economies are still relatively small, new or even non-existent. In Appendix 6, a summary of all the results of the five statements are given per factor. The second observation is that the majority *slightly disagree* on the fact that “in order for a policy synergy between the creative industry and knowledge economy to be feasible, the creative industry should operate within the innovation model” (see also Appendix 5). Based on the current evaluation, Aruba has focused on the identification of the six prospective industries, a reflection of collective industry policies, which is characterized by a

competition model. This could explain why the participants did not think a synergy between the two economies could work if the creative industry works in the innovation model was feasible for Aruba. It is simply too far-fetched for the current situation in Aruba. This also confirms that Growth Seekers are more prone to focus more on the creative industry as being a driver of growth, and why the Innovation Enthusiast and the Innovation Sceptic have a neutral opinion. This does mean that Aruba, before moving towards an innovation model, should consider the growth model first. The third observation is that the majority believe that “an advanced knowledge economy is a knowledge economy, innovation economy, and a creativity economy at the same time”, especially the Neutralists. The only one opposing this is the “innovation sceptic”. So, in this case most participants do believe that the synergy between creativity and knowledge is possible. Continuing, the fourth observation indicates that the majority of the respondents *slightly disagrees* with the notion that in order for the creative sector to play a role in the knowledge economy, the state should foster the adaptation of digitization, convergence and globalization, known also as the ‘big three’. This does not necessarily go against the synergy, but mostly reinforces that the responsibility lies within a collaborative force and not only in the hands of the government. The fifth observation is that the majority *agree* that “the use of knowledge and the incorporation of creativity is now inevitable considering the vector of growth across all sectors of the economy and to attract business opportunities, investment and a highly skilled workforce”. This belief counts for the Innovation Sceptic, especially the Neutralists and the Innovators, whereas the Growth Seekers were indifferent in this respect. This means that in Aruba the incorporation of creativity and the use of knowledge will increase in the coming years and will have influence on businesses, investments, and labor opportunities. The last observation is that the majority *agree* that “the more advanced or mature a knowledge economy or knowledge society is, the more or the better a surplus of knowledge, innovation, or creativity can be absorbed and transformed into sustainable development”. Thus, in order for Aruba to become more sustainable, it should consider the absorptive capacity of knowledge, innovation, and creativity collectively.

Now, regarding the four different Quadruple Helix Innovation Models developed by Arnkil, Järvensivu, Koski and Piirainen in 2010, the first observation is that the Innovation Enthusiasts *agree* that the “main goal of the innovation activity is to produce commercially successful high tech products and goods” (Triple Helix + Model), however the Innovators *extremely agree* with this, thus confirming their affinity towards technology. The second observation is that no one besides the Innovation Sceptics believe that “the main goal of the innovation activity is to produce goods and services relevant for firms and their clients” (Firm-

based Living Lab). Thus, a Firm-based Living Lab Model is not preferred according to this study. The third observation indicates that there is an indifferent opinion when it comes to the Public Sector-centered Living Lab, which is that “the main goal of the innovation activity is to produce products and services relevant for public authorities and the users of the public services”, however, the Innovators believe strongly in this. The fourth observation is that the Team Players, the Neutralists, the Innovation Enthusiast and the Innovators believe that “the main goal of innovation activity is to produce products and services relevant for citizens”. Only the Growth Seekers and the Innovation Sceptic do not care for a human-centered approach to innovation. Overall, the final observation is that the Innovators are the group that strongly believe in most models, which are the Triple Helix+ Model, the Public Sector-centered Living Lab, and the Citizen. While, the group with the highest number of participants, the Neutralists, prefer the Citizen-centered Living Lab.

When looking at the remaining socio-economic development factors (entrepreneurship, social innovation, and talent development), overall talent development seems to be the factor with the most distinguishing statements (see Appendix 10). The first observation for the entrepreneurship factor (see Appendix 8) is that all groups generally *do not agree* with the concept of Ecopreneurship, which is consistent with the first consensus statement. In this case the goal of ecopreneurship is to “contribute to solving environmental problem and create economic value”. The only group who *moderately agrees* with this is the Innovation Sceptic. The second observation is that most groups *somewhat agree* with the concept of social entrepreneurship and that it should “contribute to solving societal problem and create value for society”. The only groups that are slightly opposing it are the Innovation Sceptic and the Innovators. The third observation is that overall most groups *agree* with the concept of institutional entrepreneurship and that it should “contribute to changing regulatory, societal and market institutions”. The only groups opposing this are the Team Players and the Innovation Enthusiast. The fourth, and final observation, which happens to be the most surprising one, is that most groups feel indifferent or even oppose the concept of sustainable entrepreneurship and that it should “contribute to solving societal and environmental problems through the realization of a successful business”. Considering the literature, which suggests that social entrepreneurship (moderately a favorite) could map initiatives from the creative industries, and that ecopreneurship (not a favorite) could map initiatives from the knowledge economy, the ideal situation would be a synergy, which in this case is the sustainable entrepreneurship. This could mean that the participants do not understand the ideology behind sustainability and could be a reason for the hesitancy of the participants to agree with a synergy. It is not because the synergy is not desired, because the fact

is that it has already been established previously, but due to these economies not being established and developed yet, that makes it harder to envision a functional synergy.

Regarding social innovation, the first observation is that everyone, besides the Innovation Sceptic, *agrees* that innovation is not more relevant to the private sector than the public sector. Interestingly, the second observation is that the group with the greatest representation of participants, the “neutralist”, strongly agree in the involvement of civil society in harnessing innovation, thus affirming the need for a human-centered approach. The third observation is that almost everyone, besides the “innovation enthusiast” believes that “creativity is considered a crucial factor for making social innovation happen”. Regarding social innovation, all groups, besides the Team Players, *agree* that “social innovation could merge creative industries and knowledge economies, considering that creativity and knowledge can simply not be separated from each other”.

Finally, regarding talent development, the first observation is that the viewpoint is split, where one half of the groups (Team Players, Growth Seekers, and Innovation Enthusiast) *agree* that there is a disjuncture between education and the labor market, and the other half (Neutralists, Innovation Sceptic, and Innovators) does not. The second observation is that all groups *more or less agree* that skill development is an important factor to consider if you want competitive differentiation. The third observation is that most groups oppose talent development stimulation by “only providing loans for students going abroad when the subject they want to study is not being offered in home country and by making it obligatory for them to return after completion”. The only groups that consider this measure are the Team Players and the Innovation Sceptic. The last observation indicates that for the most part most groups *do not agree* that “brain drain is caused by the reduction of opportunities”. Only the Innovation Sceptic *extremely agrees* with this and the Team Players who *moderately agree*. Overall, considering the results of this research and the literature discussed previously, the participants struggle with the synergy on entrepreneurial grounds, but are convinced that through social innovation and skill development, creativity and knowledge could foster sustainable development.

9.2 Policy Recommendations

The second sub-question was related to finding out the actual perspectives of the four representative stakeholder groups (public sector, private sector, academia, and NGOs & community). As a refresher, the second sub-question is:

2. What policy measures could help sustain the synergy through the Quadruple Helix Innovation Model as a driver to stimulate innovation?

Considering the results in Appendix 11, the first observation is that the Team Players, the Neutralists and the Innovation Sceptic, all *agree* that developing countries should develop better ways to invest in R&D, and monitor and evaluate the results of their efforts. However, they *more or less agree* that “absorptive capacity is related to the assimilation of existing knowledge and technology to the ability to engage in advanced R&D and technological innovation activities”. Also, only the “innovation sceptic” and the “growth seekers” are not convinced that “absorptive capacity is related to the assimilation of existing knowledge and technology to the ability to engage in advanced R&D and technological innovation activities”. The forth observation is that all groups besides the “innovation enthusiast” believe that “it is important to consider all stakeholders in the innovation scheme of a country and to address their roles and contributions towards prosperous innovation performances within a country”, thus reconfirming a Quadruple Helix Innovation Model (QHIM), to ensure inclusivity. The fifth observation is that most groups *agree* that “effective general technology policies being a priority, including improving basic education, building appropriate infrastructure, and reducing entry barriers for local firms that could be suppliers for MNEs”. However, most groups are indecisive on whether “constructing strategic links and coordination between STI policy and other development policies (industrial policy, FDI, trade, competition, education and training, entrepreneurship and SME policies) is crucial to solidifying the improvement potential of innovation. The results of the study clearly show that for, the most part, all groups are slightly indecisive about the role and impact of R&D on innovation capacity, besides the Team Players, who have strong convictions on the importance of R&D and public policy measures.

Considering the themes covered in this study, there are eight policy recommendations to strengthen the synergy through the QHIM based on the research results and the literature with the assistance of the Edler and Fagerberg (2017) innovation policy instruments. These recommendations are:

1. Consider redefining the Aruban creative industry and knowledge economy for it to be more inclusive to other niche markets that can be successful in the Aruban context.
2. Consider utilizing the Citizen-centered Living Lab Model by Arnkil, Järvensivu, Koski and Piirainen in 2010.
3. Consider establishing other policy components that can assist the national innovation policy, such as policies on science, technology, and systems of innovation.
4. Consider developing individual policies (strategic plans) on these economies that target specific barriers and demands, instead of only having one general economic policy.

5. Consider accelerating an integral entrepreneurship policy, which include legislative, regulatory, and supportive instruments that tackles FDI.
6. Consider policies on labor, skill development, and training inside and outside of the Aruban labor market.
7. Consider increasing public R&D investment, and firm-level fiscal incentives and support for R&D and innovation.
8. Consider strengthening the Aruban IPR by introducing policies on increasing applications and registrations by making BIE a more participatory institution in the economy and academia.

These recommendations are merely reflective of the top 10 agreed and disagreed statements, the distinguishing statements and the consensus statements. Having an accelerated focus on innovation (policy-wise) will require reassurance that all necessary components are being fulfilled, because without a stable foundation in place, inevitably the results could lead to a less desirable outcome. Effective policy making remains an aspect of importance for most perspectives and should not be underestimated by the stakeholders moving forward.

10. Conclusion

The need for recognizing the role of innovation, knowledge, and creativity in expanding economic potential towards sustainable socio-economic development is inevitable. Aruba's vision to become the leading innovative island in the Caribbean, a vision that has ultimately led to the current financial and social climate, were the source of inspiration to research and identify the perspectives of relevant stakeholders on the possible synergy of two prospective economies: the creative industry and the knowledge economy. After establishing a thorough literature review and a discourse of the different perspectives with the completion of 28 Q-sorts, the application of the Q-methodology identified five different social perspectives on the possible synergy between the creative industry and the knowledge economy in Aruba.

The first perspective is called the Team Players since they highly value inclusivity. With their concern for developing countries and the Caribbean, the Team Players see great importance in effective policy making, R&D investment and monitoring, intervention in the disjuncture between the education system and labor market, and developing Aruba's absorptive capacity through knowledge and technology assimilation. The second perspective is defined as Growth Seekers because their interest lies mainly in development and economic validity, especially considering their strong perception of the creative industry being part of the growth model. Similarly to the Team Players, the Growth Seekers also see the importance of effective policy making, however, unlike the Team Players, they do not grasp innovation yet as a priority, but do recognize the value of creativity and knowledge in socio-economic development.

The third and biggest represented perspective were the Neutralists. Neutralists, generally speaking, are indecisive on some aspects of the synergy between the two economies, but do recognize the imperative need for creativity and knowledge, and agree that these two economies should be connected. They also value inclusivity and effective policy making as tools to ensure that Aruba not only progresses, but innovates as well. The fourth perspective is deemed bipolar and is therefore categorized between two opposite perspectives: The Innovation Enthusiast and the Innovation Sceptic. The Innovation Enthusiast believes in technology adoption, reinforcing policy makers so that they are equipped to contextualize policies to Aruban, helping firms build their innovative capacity, and limiting involvement of too many stakeholders, while the Innovation Sceptic has opposite beliefs. The last perspective is called the Innovators, and, while they share some viewpoints as some of the groups, they have an increased liking of the QHIMs and the essence of innovative activity.

Overall, the main research question of this study was to determine:

To what extent can a synergy between the creative industry and a knowledge-based economy, implemented within a Quadruple Helix Innovation Model stimulate sustainable socio-economic development in the local innovation system of Aruba?

Based on the results it can be concluded that the participants at this moment cannot comprehend how a synergy between the two economies could work within the innovation model, because it is simply too far-fetched for the current situation in Aruba. Considering that even though Aruba does have a creative industry, yet underdeveloped, it still has not developed a stable knowledge economy, making it difficult to envision a synergy. However, they are open to the possibility of a synergy due to their agreement that creativity, knowledge and innovation are connected to each other. Thus, with identifying this possible synergy and agreeing that Aruba is still not ready for this synergy, there is also the imperative demand to establish effective policies to equip this possible synergy and accelerate innovation on the island on all levels in the years to come. These effective policies should include distinctive attention in areas such as education, national innovation strategies, FDI and IPR development, creating an economic environment suited towards these economies, reinforcing entrepreneurship, talent and skill development, and social innovation. Bearing in mind the four QHIM models discussed, and the increased desire for an inclusive and participatory approach, according to the participants Aruba should consider continuing its innovation journey using the Citizen-centered Living Lab approach and as advancements are accomplished and capacities are in place, consider implementing other models. The time has come for Aruba and the Aruban society to embrace its socio-economic development through creativity, knowledge, and innovation. Not only for now, but for the generations to come.

10.1 Research Limitations

Research processes are all different and encounter limitations that influence research results and for this research it was not any different. Some research limitations are related to the data collection method. In a traditional Q-method, the Q-sorting is completed in person with the use of que cards. However, considering the geographical distance between the researcher and participants, a digital approach was the most efficient and effective method to collect the data needed. Collecting the data specifically using the Q-sortware software was very easy and manageable, however, a small number of participants had trouble sorting the 40 statements on their electronic devices. Specific reasons for this are not known. Another limitation was that participants did not always complete their participation. Some signed the consent form and forgot to sort the 40 statements, while others completed the sorting but simply forgot to save

their input resulting in their participation not being recorded in the data base. Also, for participants who could not understand the sorting process, having a participation guide booklet was simply not enough. It was difficult to make sure that all participants read through the booklets they were provided. Additionally, the data collection period was close to the summer vacation days resulting in some participants, who in the beginning confirmed their participation, did not participate after all due to vacation leave. Even though this research has a considerable number of participants, conducting the data collection online has resulted in less participation compared to the possibility of doing it face-to-face. However, even with less participation, the threshold of the minimum number of participants (13) was surpassed greatly and has resulted in valuable results. Furthermore, the fifth limitation revolves around external validity of the results. The results are based by representative stakeholders in Aruba, which means the results are only reflective of the social viewpoints in Aruba. Lastly, the sixth limitation revolves around the data availability and transparency. Considering the fact that most institutions on Aruba do not have actualized data available on their websites, makes it more difficult to compile relevant statistics of the Aruban situation. Overall, online data collection using Q-methodology is possible, but it will take extra effort to follow up with the participants and make sure that they participate and complete all steps.

10.2 Further Research and Practice

Since Q-methodology remains uncommon among researchers, this research adds a new study to the Q-methodology community. Using new methods, such as Q-methodology, can increase the academic community's awareness of other methods that can be used to explore people's perspectives, rather than using existing questionnaire and interview tools, especially when it comes to small-scaled research, which are ideal scopes for local context research within small island states. Using the Q-methodology, both data on the differences and commonalities between the five perspectives were gathered, thus it would be recommended that policy makers consider the viewpoints of the stakeholders as a guide when formulating future policies regarding the Aruban creative industry and knowledge economy. It is also recommended that professionals in these fields would consider using these results as a framework for improvement. Further detailed research should be conducted individually on the socio-economic development factors used in this study, which include entrepreneurship, social innovation, and talent development. However, the remaining two innovation spaces might also benefit greatly from a Q-study, which could contribute to the results of the chosen innovation spaces in this research.

Further research should also be conducted on the Aruban local innovation system as it could contribute to the development of a more holistic and participatory innovation policy.

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12. Appendices

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Appendix 1. Statements

| N | C | Statement |
|----------|----------|---|
| 1 | D | The creative industry is perceived as an economic drain, due to the production of activities/products of high cultural value, but at the same time low market value. |
| 2 | P | The Aruban creative industry should only include "Art & Music, Graphic design, Photography, Web design, Art studios and Fashion". |
| 3 | P | The creative industries are just another member of the industrial community, and they should rightfully then demand neither more nor less 'assistance' than that due to others". |
| 4 | D | The creative industry is part of the entire growth model of the economy through supply and demand. |
| 5 | D | The creative industries may not be well characterized as an industry per se, but rather as an element of the innovation system. |
| 6 | P | The intention of the knowledge economy should be to develop new technologies, adopt them locally to tackle local challenges on the island and to showcase these solutions as export services. |
| 7 | P | The Aruban knowledge economy should only include Solar Energy, Ocean Technology & Cooling, Higher education & Export, and ICT island based solutions efficiency and innovation for export. |
| 8 | O | If a country lacks a good knowledge base, it is likely to have poor governance, which in turn will steer capital away. |
| 9 | O | Within the knowledge economy firms are compelled to develop a creative, innovative capacity that can generate new ideas, solutions and products. |
| 10 | P | The Government should provide an intellectual property vision and leadership. |
| 11 | O | In order for a policy synergy between the creative industry and knowledge economy to be feasible, the creative industry should operate within the innovation model. |
| 12 | D | An advanced knowledge economy is a knowledge economy, innovation economy, and a creativity economy at the same time. |
| 13 | O | The creative sector could play an important role within the knowledge-economy but this depends on the adaptation to the "big three" (digitization, convergence and globalization) fostered by the state itself. |
| 14 | D | Considering the pressure SIDSs endure to remain competitive and resilient to external shocks. The use of knowledge and the incorporation of creativity is now inevitable considering the vector of growth across all sectors of the economy and to attract business opportunities, investment and a highly skilled workforce. |
| 15 | O | The more advanced or mature a knowledge economy or knowledge society is, the more or the better a surplus of knowledge, innovation, or creativity can be absorbed and transformed into sustainable development. |
| 16 | O | The biggest challenge for the Caribbean is not only that islands lack capacity, because that can be remedied with proper policy measures, but that policy makers have no clue how to transform best practices from developed countries into the local innovation context for island states. |
| 17 | P | Aruba should become a living lab for innovative island solutions for the Caribbean. |
| 18 | P | Entrepreneurs should solve environmental problem and creative economic value. |
| 19 | P | Entrepreneurs should solve societal problems and creative value for society. |
| 20 | P | Entrepreneurs should contribute to changing regulatory, societal and market institutions. |

- 21 P Entrepreneurs should solve societal and environmental problems through the realization of a successful business.
- 22 O Innovation is more relevant to the private than the public sector.
- 23 D Harnessing innovation for sustainable and inclusive development requires changes in the direction of key economic and social processes which cannot take place without the strong involvement of civil society.
- 24 D Creativity is considered a crucial factor for making social innovation happen, where creativity can be seen as the human ability to produce new things, or create new situations, rather than the innovative use of available resources and/or of known technologies.
- 25 O Social innovation could merge creative industries and knowledge economies, considering that creativity and knowledge can simply not be separated from each other.
- 26 O A main weakness in the Caribbean is the disjuncture between the educational system and the labor market, impeding realization of the full potential of both women and men.
- 27 D Economic value and competitive differentiation of cities will increasingly be derived from people and their skills, creativity and knowledge, as well as the capacity of the economy to create and absorb innovation.
- 28 O The way to stimulate talent development is to only provide loans for students going abroad when the subject they want to study is not being offered in home country and by making it obligatory for them to return after completion.
- 29 O Brain drain is caused by the reduction of opportunities in the developing countries, next to the international labor market demand.
- 30 D Innovation activity means producing commercially successful high tech products and goods.
- 31 D Innovative activity means producing goods and services relevant for firms and their clients.
- 32 D Innovative activity means producing products and services relevant for public authorities and the users of the public services.
- 33 D Innovative activity means producing products and services relevant for citizens.
- 34 D Effective innovation policy making will entail specific attention on research, education, trade and industry development, financing and other determining factors.
- 35 P Developing countries should develop better ways to invest, monitor and evaluate the results of the R&D effort they fund in public laboratories, universities, and the productive sector.
- 36 O For developing countries absorptive capacity is related to the assimilation of existing knowledge and technology to the ability to engage in advanced R&D and technological innovation activities.
- 37 D The capacities of firms to introduce innovations in local, national and international markets are a requirement for high-tech upgrading and improving the productive capacity of a country.
- 38 O It is important to consider all stakeholders in the innovation scheme of a country and to address their roles and contributions towards prosperous innovation performances within a country.
- 39 O A main priority in all types of developing countries is effective general technology policies, including improving basic education, building appropriate infrastructure, and reducing entry barriers for local firms that could be suppliers for MNEs.
- 40 O Constructing strategic links and coordination between STI policy and other development policies (industrial policy, FDI, trade, competition, education and training, entrepreneurship and SME policies) is crucial to solidifying the improvement potential of innovation.

Note: All statements are organized within three categories: D - Definition P - Perspective O - Opinion/Fact; N = statement number

Appendix 2. Q-sort Overview

| | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
|------------|-----------|-----------|-----------|-------------|-------------------|-------------------------|--------------------|-------------|----------|----------|----------|
| p01 | 2 | 7,28 | 30,31,33 | 14,29,32,35 | 5,22,36,37,39,40 | 1,3,12,13,15,34,27,38 | 6,8,9,16,17,26 | 19,20,21,25 | 18,23,24 | 10,11 | 4 |
| p02 | 3 | 22,28 | 1,37,38 | 14,24,29,36 | 7,11,15,25,27,35 | 2,4,5,10,20,23,34,40 | 9,17,18,31,32,39 | 8,13,21,30 | 12,26,33 | 16,19 | 6 |
| p03 | 7 | 2,28 | 18,19,21 | 3,22,29,30 | 27,33,37,38,39,40 | 1,5,6,8,11,12,23,34 | 14,15,16,17,24,26 | 25,32,35,36 | 13,20,31 | 4,9 | 10 |
| p04 | 28 | 7,18 | 5,22,30 | 2,11,33,39 | 12,19,25,26,37,40 | 3,4,8,13,20,31,32,36 | 1,10,16,17,23,35 | 14,21,24,34 | 15,27,38 | 9,29 | 6 |
| p05 | 1 | 2,7 | 3,22,28 | 10,16,30,37 | 5,6,13,31,32,33 | 4,11,23,26,27,29,36,39 | 17,19,25,35,38,40 | 9,15,20,34 | 8,14,24 | 12,18 | 21 |
| p06 | 7 | 16,22 | 21,29,35 | 26,28,31,38 | 11,12,13,19,23,34 | 3,5,9,17,18,20,36,37 | 4,10,14,15,24,40 | 2,6,8,25 | 1,33,27 | 30,32 | 39 |
| p07 | 1 | 2,7 | 6,22,28 | 3,11,30,31 | 5,13,29,32,33,37 | 10,26,34,35,36,38,39,40 | 18,19,20,21,25,27 | 14,17,23,24 | 9,15,16 | 8,12 | 4 |
| p08 | 2 | 5,7 | 3,22,24 | 1,4,13,14, | 10,12,21,25,37,40 | 9,11,15,17,18,20,23,29 | 6,27,30,31,32,34 | 8,16,26,33 | 19,35,36 | 28,39 | 38 |
| p09 | 1 | 7,22 | 2,28,29 | 3,15,30,31 | 5,11,13,18,32,35 | 6,8,17,19,20,21,36,40 | 4,10,25,26,27,33 | 9,34,37,39 | 14,24,38 | 16,23 | 12 |
| p10 | 3 | 22, 28 | 30,35,37 | 17,18,23,33 | 9,19,21,27,36,38 | 2,6,7,10,14,25,26,31 | 13,29,32,34,39,40 | 5,11,20,24 | 4,8,12 | 15,16 | 1 |
| p11 | 6 | 7,16 | 3,17,25 | 2,26,36,39 | 11,28,30,32,33,34 | 13,14,19,22,23,27,37,40 | 1,4,10,12,15,24 | 5,8,21,38 | 9,18,20 | 31,35 | 29 |
| p12 | 2 | 4,7 | 28,30,31 | 1,3,22,32 | 5,11,13,14,26,29 | 6,16,18,19,20,21,37,40 | 9,15,33,36,38,39 | 8,10,12,25 | 27,34,35 | 23,24 | 17 |
| p13 | 1 | 7,28 | 5,16,30 | 11,22,25,26 | 2,12,13,18,21,37 | 3,8,9,14,19,29,36,38 | 6,10,15,17,24,31 | 4,32,34,35 | 20,39,40 | 23,27 | 33 |
| p14 | 28 | 2,31 | 5,20,22 | 24,27,32,36 | 21,25,26,29,30,35 | 3,15,33,34,37,38,39,40 | 13,14,16,17,18,19 | 8,11,12,23 | 1,7,10 | 4,9 | 6 |
| p15 | 28 | 2,22 | 6,7,26 | 16,18,19,30 | 1,5,11,13,20,21 | 4,10,14,34,35,36,37,40 | 3,27,29,31,32,39 | 9,12,17,25 | 23,24,33 | 15,38 | 8 |
| p16 | 22 | 3,7 | 2,27,30 | 1,11,21,31 | 18,19,20,28,36,37 | 4,6,10,16,23,25,32,40 | 5,14,15,29,33,38 | 9,24,34,39 | 12,13,17 | 8,35 | 26 |
| p17 | 2 | 3,37 | 8,11,22 | 7,15,18,30 | 4, 13,14,19,21,28 | 9,16,20,27,29,31,32,36 | 24,33,34,35,39, 40 | 1,6,23,25 | 5,17,38 | 10,26 | 12 |
| p18 | 28 | 29,38 | 1,7,22 | 2,21,24,30 | 27,31,35,36,39,40 | 5,10,11,16,18,19,25,37 | 4,20,26,32,33,34 | 3,14,15,23 | 6,9,13 | 8,12 | 17 |
| p19 | 2 | 3,7 | 11,22,28 | 5,21,23,32 | 12,18,19,20,30,31 | 1,4,6,14,15,25,27,33 | 8,9,10,16,17,26 | 13,37,39,40 | 35,36,38 | 24,34 | 29 |
| p20 | 2 | 1,29 | 7,22,28 | 11,15,16,26 | 10,17,18,19,21,30 | 4,13,20,25,31,32,35,37 | 3,5,6,14,34,40 | 12,33,36,38 | 8,24,39 | 9,23 | 27 |
| p21 | 22 | 28,30 | 3,5,7 | 2,4,20,21 | 1,11,13,18,26,37 | 12,17,25,31,32,33,39,40 | 6,19,23,29,35,38 | 10,27,34,36 | 8,14,24 | 9,16 | 15 |
| p22 | 2 | 22,37 | 3,7,29 | 16,23,36,40 | 6,12,18,21,27,35 | 5,11,14,15,31,32,33,38 | 17,19,20,28,30, 39 | 9,24,25,26 | 1,4,13 | 8,34 | 10 |
| p23 | 7 | 22,28 | 1,5,20 | 15,24,26,35 | 13,17,18,19,21,30 | 11,25,27,32,33,34,36,39 | 2,3,10,12,38,40 | 4,6,31,37 | 16,23,29 | 9,14 | 8 |
| p24 | 1 | 22,28 | 2,7,18 | 5,15,21,30 | 4,12,19,27,31,38 | 3,11,13,20,24,25,29,33 | 17,23,32,36,37,40 | 6,9,35,39 | 10,26,34 | 8,16 | 14 |
| p25 | 22 | 2,5 | 3,7,17 | 1,8,15,25 | 4,16,18,19,20,21 | 6,9,12,13,26,35,36,40 | 23,29,34,37,38,39 | 30,31,32,33 | 14,27,28 | 11,24 | 10 |
| p26 | 16 | 2,5 | 7,11,18 | 13,22,23,26 | 19,25,28,29,31,37 | 6,8,15,24,27,34,35,39 | 1,12,17,33,36,40 | 4,10,21,32 | 3,20,30 | 9,38 | 14 |
| p27 | 22 | 28,36 | 6,7,40 | 1,16,18,38 | 5,19,20,31,35,37 | 23,26,27,29,30,32,33,34 | 10,15,17,21,24, 39 | 11,12,13,14 | 4,9,25 | 2,8 | 3 |
| p28 | 22 | 1,16 | 2,7,28 | 3,4,5,11 | 18,19,20,21,26,29 | 12,27,34,35,36,37,38,39 | 24,30,31,32,33,40 | 14,15,23,25 | 6,9,17 | 10,13 | 8 |

Appendix 3. Different Quadruple Helix Models (Arnkil, Järvensivu, Koski, & Piirainen, 2010)

| Model | Definition | F1 | F2 | F3 | F4a | F4b | F5 |
|-----------------------------------|--|----|----|----|-----|-----|----|
| Triple Helix+ Model | The main goal of the innovation activity is to produce commercially successful high tech products and goods | - | MD | D | MA | MD | EA |
| Firm-centered Living Lab | The main goal of the innovation activity is to produce goods and services relevant for firms and their clients. | - | - | - | D | A | MD |
| Public Sector-centered Living Lab | The main goal of the innovation activity is to produce products and services relevant for public authorities and the users of the public services. | - | MD | - | - | - | SA |
| Citizen-centered Living Lab | The main goal is to produce products and services relevant for citizens. | MA | - | - | A | D | A |

Note: MA – Moderately Agree (2), A – Agree (3), SA – Strongly Agree (4), EA – Extremely Agree (5), MD – Moderately Disagree (-2), D – Disagree (-3), SD – Strongly Disagree (-4), ED – Extremely Disagree (-5)

Appendix 4. Different kinds entrepreneurship (Schaltegger & Wagner, 2011)

| Model | Definition | F1 | F2 | F3 | F4a | F4b | F5 |
|--------------------------------|---|----|----|----|-----|-----|----|
| Ecopreneurship | Contribute to solving environmental problem and create economic value. | MD | - | - | MD | MA | - |
| Social Entrepreneurship | Contribute to solving societal problem and create value for society. | - | - | - | MA | MD | - |
| Institutional Entrepreneurship | Contribute to changing regulatory, societal and market institutions. | - | A | - | D | A | - |
| Sustainable Entrepreneurship | Contribute to solving societal and environmental problems through the realization of a successful business. | D | - | - | - | - | - |

Note: MA – Moderately Agree (2), A – Agree (3), SA – Strongly Agree (4), EA – Extremely Agree (5), MD – Moderately Disagree (-2), D – Disagree (-3), SD – Strongly Disagree (-4), ED – Extremely Disagree (-5)

Appendix 5. Four Creative Industry Models (Potts & Cunningham, 2008)

| Model | Definition | F1 | F2 | F3 | F4a | F4b | F5 |
|-------------------|--|----|----|----|-----|-----|----|
| Welfare Model | The Creative Industry consumes more resources than it produces. | - | SA | SD | D | A | A |
| Competition Model | The Creative Industry is just another industry. | SD | SD | MD | - | - | - |
| Growth Model | The Creative Industries is a driver of growth | MD | EA | - | - | - | MA |
| Innovation Model | The Creative Industry is an element of the innovation system of the whole economy. | D | - | MD | - | - | MD |

Note: MA – Moderately Agree (2), A – Agree (3), SA – Strongly Agree (4), EA – Extremely Agree (5), MD – Moderately Disagree (-2), D – Disagree (-3), SD – Strongly Disagree (-4), ED – Extremely Disagree (-5)

Appendix 6. Perspectives - Synergy between the Creative Industry and Knowledge Economy

| N | C | Statement | F1 | F2 | F3 | F4a | F4b | F5 |
|-----------|----------|--|-----------|-----------|-----------|------------|------------|-----------|
| 11 | S | In order for a policy synergy between the creative (...) | -1 | 1 | -2 | 0 | 0 | -2 |
| 12 | S | An advanced knowledge economy is a knowledge (...) | 1 | 1 | 3* | 1 | -1 | 0 |
| 13 | S | The creative sector should play an important role within (...) | -1 | 2 | -2 | 1 | -1 | -1 |
| 14 | S | Considering the pressure SIDSs endure to remain (...) | -1 | 0 | 3 | -1 | 1 | 3 |
| 15 | S | The more advanced or mature a knowledge economy (...) | -2 | 2 | 2 | -1 | 1 | 0 |

Note: N –statement number; C – Category; * indicates a distinguishing statement

Appendix 7. Perspectives- QHIM (Arnkil, Järvensivu, Koski, & Piirainen, 2010)

| N | M | Definition | F1 | F2 | F3 | F4a | F4b | F5 |
|-----------|----------|--|-----------|------------|-----------|------------|------------|-----------|
| 30 | TM | The main goal of the innovation activity is to produce commercially successful high tech products and goods | 0 | -2 | -3 | 2 | -2 | 5* |
| 31 | F | The main goal of the innovation activity is to produce goods and services relevant for firms and their clients. | 0 | 0 | -1 | -3 | 3 | -2 |
| 32 | P | The main goal of the innovation activity is to produce products and services relevant for public authorities and the users of the public services. | 0 | 0 | -1 | 1 | -1 | 4* |
| 33 | C | The main goal is to produce products and services relevant for citizens. | 2 | -2* | 1 | 3 | -3 | 3 |

Note: N –statement number; M – Model; TM – Triple Helix + Model, F – Firm-centered Living Lab, P – Public Sector-centered Living Lab, C – Citizen-centered Living Lab; * indicates a distinguishing statement

Appendix 8. Perspectives – Entrepreneurship (Schaltegger & Wagner, 2011)

| N | M | Definition | F1 | F2 | F3 | F4a | F4b | F5 |
|-----------|----------|---|-----------|-----------|-----------|------------|------------|-----------|
| 18 | E | Contribute to solving environmental problem and create economic value. | -2 | -1 | -1 | -2 | 2 | -1 |
| 19 | SoE | Contribute to solving societal problem and create value for society. | 1 | 0 | 0 | 2 | -2 | -1 |
| 20 | IE | Contribute to changing regulatory, societal and market institutions. | -1 | 3 | 0 | -3 | 3 | 1 |
| 21 | SuE | Contribute to solving societal and environmental problems through the realization of a successful business. | -3 | -1 | 0 | 0 | 0 | -1 |

Note: N – statement number; M – Model; E – Ecopreneurship, SoE – Social Entrepreneurship, IE – Institutional Entrepreneurship, SuE – Sustainable Entrepreneurship; * indicates a distinguishing statement

Appendix 9. Perspectives – Social Innovation

| N | Statement | F1 | F2 | F3 | F4a | F4b | F5 |
|-----------|---|-----------|-----------|-----------|------------|------------|-----------|
| 22 | Innovation is more relevant to the private than the public sector. | -3 | -4 | -3 | -2 | 2 | -4 |
| 23 | Harnessing innovation for sustainable and inclusive development requires changes in the direction of key economic and social processes which cannot take place without the strong involvement of civil society. | 0 | -1 | 4* | 0 | 0 | -1 |
| 24 | Creativity is considered a crucial factor for making social innovation happen, where creativity can be seen as the human ability to produce new things, or create new situations, rather than the innovative use of available resources and/or of known technologies. | 1 | 3 | 3 | -2* | 2* | 0 |
| 25 | Social innovation could merge creative industries and knowledge economies, considering that creativity and knowledge can simply not be separated from each other. | -1 | 2 | 1 | 2 | 0 | 1 |

Note: N – statement number; M – Model; * indicates a distinguishing statement

Appendix 10. Perspectives – Talent Development

| N | Statement | F1 | F2 | F3 | F4a | F4b | F5 |
|-----------|--|-----------|-----------|------------|------------|------------|-----------|
| 26 | A main weakness in the Caribbean is the disjuncture between the educational system and the labor market, impeding realization of the full potential of both women and men. | 3 | 1 | -1 | 4 | -4 | -3 |
| 27 | Economic value and competitive differentiation of cities will increasingly be derived from people and their skills, creativity and knowledge, as well as the capacity of the economy to create and absorb innovation. | 1 | -1 | 2 | 0 | 0 | 2 |
| 28 | The way to stimulate talent development is to only provide loans for students going abroad when the subject they want to study is not being offered in home country and by making it obligatory for them to return after completion. | 2* | -3 | -4* | -1 | 1 | -2 |
| 29 | Brain drain is caused by the reduction of opportunities in the developing countries, next to the international labor market demand. | 2* | -2 | -1* | -5* | 5* | -3 |

Note: N – statement number; M – Model; * indicates a distinguishing statement

Appendix 11. Perspectives – Public Policy and STI Policy

| N | Statement | F1 | F2 | F3 | F4a | F4b | F5 |
|-----------|--|-----------|------------|-----------|------------|------------|-----------|
| 35 | Developing countries should develop better ways to invest, monitor and evaluate the results of the R&D effort they fund in public laboratories, universities, and the productive sector. | 4* | -2 | 0* | -4 | 4 | -3 |
| 36 | For developing countries absorptive capacity is related to the assimilation of existing knowledge and technology to the ability to engage in advanced R&D and technological innovation activities. | 3* | -1 | 0 | 1 | -1 | 0 |
| 37 | The capacities of firms to introduce innovations in local, national and international markets are a requirement for high-tech upgrading and improving the productive capacity of a country. | -2 | -3* | -1 | -1 | 1 | 0 |

| | | | | | | | |
|-----------|--|-----------|----|---|------------|-----------|---|
| 38 | It is important to consider all stakeholders in the innovation scheme of a country and to address their roles and contributions towards prosperous innovation performances within a country. | 5* | 0 | 2 | -4* | 4* | 0 |
| 39 | A main priority in all types of developing countries is effective general technology policies, including improving basic education, building appropriate infrastructure, and reducing entry barriers for local firms that could be suppliers for MNEs. | 4 | 0 | 1 | 2 | -2 | 4 |
| 40 | Constructing strategic links and coordination between STI policy and other development policies (industrial policy, FDI, trade, competition, education and training, entrepreneurship and SME policies) is crucial to solidifying the improvement potential of innovation. | 0 | -1 | 0 | 0 | 0 | 1 |

Note: N – statement number; M – Model; * indicates a distinguishing statement



Nada no ta cai fo'i shelo – Aruban Proverb
"Nothing falls from the sky" – Nothing in life is for free,
hard work is required to achieve all your goals.

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